



SEQUENCE LISTING

<110> DE JONGE, Paul
Jing, Wei

<120> TARGETED GLYCOSAMINOGLYCAN POLYMERS BY POLYMER GRAFTING AND
METHODS OF MAKING AND USING SAME

<130> 3554.097

<140> 10/642,248

<141> 2003-08-15

<150> 60/404,356

<151> 2002-08-16

<150> 60/479,432

<151> 2003-06-18

<150> 60/491,362

<151> 2003-07-31

<150> 10/195,908

<151> 2002-07-15

<150> 09/437,277

<151> 1999-11-01

<150> 60/107,929

<151> 1998-11-11

<150> 09/283,402

<151> 1999-04-01

<150> 60/080,414

<151> 1998-04-02

<150> 09/842,484

<151> 2001-04-25

<150> 60/199,538

<151> 2000-04-25

<150> 10/142,143

<151> 2002-05-08

<150> 60/289,554

<151> 2001-05-08

<160> 85

<170> PatentIn version 3.3

<210> 1

<211> 2920

<212> DNA

<213> Pasteurella multocida

<400> 1

atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60

aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120

aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaa 180

aaagaagaaa aagtcaatgt ttgcatagat ccgtagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtagca	360
aaagattttc ccaaagatct ggtttttagcg cctttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgtagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttcta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaagggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgccggcg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaagaat ttttaaaga taaaacgcta gcttggttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100

aaagatatta aaatcatcca gaataaagat gccaaaatcg cagtcagtat tttttatccc 2160
 aatacattaa acggcttagt gaaaaaacta aacaatatta ttgaatataa taaaaatata 2220
 ttcgttattg ttctacatgt tgataagaat catcttacac cagatatcaa aaaagaaata 2280
 ctagccttct atcataaaca tcaagtgaat attttactaa ataatgatat ctcattattac 2340
 acgagtaata gattaataaa aactgaggcg catttaagta atattaataa attaagtcag 2400
 ttaaactctaa attgtgaata catcattttt gataatcatg acagcctatt cgttaaaaat 2460
 gacagctatg cttatatgaa aaaatatgat gtcggcatga atttctcagc attaacacat 2520
 gattggatcg agaaaatcaa tgcgcattcca ccatttaaaa agctcattaa aacttatttt 2580
 aatgacaatg acttaaaaag tatgaatgtg aaaggggcat cacaagggtat gtttatgacg 2640
 tatgcgctag cgcattgagct tctgacgatt attaaagaag tcatcacatc ttgccagtca 2700
 attgatagtg tgccagaata taacactgag gatatttggg tccaatttgc acttttaatc 2760
 ttagaaaaga aaaccggcca tgtatttaat aaaacatcga ccctgactta tatgccttgg 2820
 gaacgaaaat tacaatggac aaatgaacaa attgaaagtg caaaaagagg agaaaatata 2880
 cctgttaaca agttcattat taatagtata actctataaa 2920

<210> 2
 <211> 972
 <212> PRT
 <213> Pasteurella multocida

<400> 2

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
 1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
 20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
 35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
 50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
 65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
 85 90 95

Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
 100 105 110

Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
210 215 220

Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
225 230 235 240

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
245 250 255

Val His Ser Tyr Val Ala Glu Leu Leu Glu Asp Asp Asp Leu Thr Ile
260 265 270

Ile Gly Pro Arg Lys Tyr Ile Asp Thr Gln His Ile Asp Pro Lys Asp
275 280 285

Phe Leu Asn Asn Ala Ser Leu Leu Glu Ser Leu Pro Glu Val Lys Thr
290 295 300

Asn Asn Ser Val Ala Ala Lys Gly Glu Gly Thr Val Ser Leu Asp Trp
305 310 315 320

Arg Leu Glu Gln Phe Glu Lys Thr Glu Asn Leu Arg Leu Ser Asp Ser
325 330 335

Pro Phe Arg Phe Phe Ala Ala Gly Asn Val Ala Phe Ala Lys Lys Trp
340 345 350

Leu Asn Lys Ser Gly Phe Phe Asp Glu Glu Phe Asn His Trp Gly Gly
355 360 365

Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Arg Tyr Gly Ser Phe Phe
370 375 380

Lys Thr Ile Asp Gly Ile Met Ala Tyr His Gln Glu Pro Pro Gly Lys
385 390 395 400

Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Asn Ile Thr Leu Asp Ile
405 410 415

Met Arg Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu
420 425 430

Asp Ser His Ile Asn Arg Val Pro Leu Val Ser Ile Tyr Ile Pro Ala
435 440 445

Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn
450 455 460

Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr
465 470 475 480

Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg
485 490 495

Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn
500 505 510

Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser
515 520 525

Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe
530 535 540

Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val
545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe
565 570 575

Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met
580 585 590

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Lys Ile
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
 625 630 635 640
 Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
 645 650 655
 Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Thr Tyr Tyr Asn
 660 665 670
 Tyr Asp Glu Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
 675 680 685
 Lys Thr Ala Glu Tyr Gln Glu Glu Ile Asp Ile Leu Lys Asp Ile Lys
 690 695 700
 Ile Ile Gln Asn Lys Asp Ala Lys Ile Ala Val Ser Ile Phe Tyr Pro
 705 710 715 720
 Asn Thr Leu Asn Gly Leu Val Lys Lys Leu Asn Asn Ile Ile Glu Tyr
 725 730 735
 Asn Lys Asn Ile Phe Val Ile Val Leu His Val Asp Lys Asn His Leu
 740 745 750
 Thr Pro Asp Ile Lys Lys Glu Ile Leu Ala Phe Tyr His Lys His Gln
 755 760 765
 Val Asn Ile Leu Leu Asn Asn Asp Ile Ser Tyr Tyr Thr Ser Asn Arg
 770 775 780
 Leu Ile Lys Thr Glu Ala His Leu Ser Asn Ile Asn Lys Leu Ser Gln
 785 790 795 800
 Leu Asn Leu Asn Cys Glu Tyr Ile Ile Phe Asp Asn His Asp Ser Leu
 805 810 815
 Phe Val Lys Asn Asp Ser Tyr Ala Tyr Met Lys Lys Tyr Asp Val Gly
 820 825 830
 Met Asn Phe Ser Ala Leu Thr His Asp Trp Ile Glu Lys Ile Asn Ala
 835 840 845
 His Pro Pro Phe Lys Lys Leu Ile Lys Thr Tyr Phe Asn Asp Asn Asp
 850 855 860
 Leu Lys Ser Met Asn Val Lys Gly Ala Ser Gln Gly Met Phe Met Thr
 865 870 875 880

Tyr Ala Leu Ala His Glu Leu Leu Thr Ile Ile Lys Glu Val Ile Thr
885 890 895

Ser Cys Gln Ser Ile Asp Ser Val Pro Glu Tyr Asn Thr Glu Asp Ile
900 905 910

Trp Phe Gln Phe Ala Leu Leu Ile Leu Glu Lys Lys Thr Gly His Val
915 920 925

Phe Asn Lys Thr Ser Thr Leu Thr Tyr Met Pro Trp Glu Arg Lys Leu
930 935 940

Gln Trp Thr Asn Glu Gln Ile Glu Ser Ala Lys Arg Gly Glu Asn Ile
945 950 955 960

Pro Val Asn Lys Phe Ile Ile Asn Ser Ile Thr Leu
965 970

<210> 3
<211> 2979
<212> DNA
<213> Pasteurella multocida

<400> 3
ttataaactg attaaagaag gtaaacgatt caagcaaggt taatttttaa aggaaagaaa 60
atgaatacat tatcacaagc aataaaagca tataacagca atgactatga attagcactc 120
aaattatttg agaagtctgc tgaaacctac gggcgaaaaa tcgttgaatt ccaaattatc 180
aatgttaaag aaaaactctc gaccaattct tatgtaagtg aagataaaaa aaacagtgtt 240
tgcgatagct cattagatat cgcaacacag ctcttacttt ccaacgtaaa aaaattaact 300
ctatccgaat cagaaaaaaa cagtttaaaa aataaatgga aatctatcac tgggaaaaaa 360
tcggagaacg cagaaatcag aaagggtgga ctagtaccga aagattttcc taaagatctt 420
gttcttgctc cattgccaga tcatgttaat gattttacat ggtacaaaaa tcgaaaaaaa 480
agcttaggta taaagcctgt aaataagaat atcgggtcttt ctattattat tcctacattt 540
aatcgtagcc gtattttaga tataacgtta gcctgtttgg tcaatcagaa aacaaactac 600
ccatttgaag tcgttggtgc agatgatggg agtaaggaaa acttacttac cattgtgcaa 660
aaatacgaac aaaaacttga cataaagtat gtaagacaaa aagattatgg atatcaattg 720
tgtgcagtca gaaacttagg ttacgtaca gcaaagtatg attttgtctc gattctagac 780
tgcgatatgg caccacaaca attatggggt cattcttatt ttacagaact attagaagac 840
aatgatattg ttttaattgg acctagaaaa tatgtggata ctcataatat taccgcagaa 900
caattcctta acgatccata tttaatagaa tctactactg aaaccgctac aaataacaat 960
ccttcgatta catcaaaagg aaatatatcg ttggattgga gattagaaca tttcaaaaaa 1020

accgataatc	tacgtctatg	tgattctccg	tttcgttatt	ttagttgcgg	taatgttgca	1080
ttttctaaag	aatggctaaa	taaagtaggt	tggttcgatg	aagaatttaa	tcattggggg	1140
ggcgaagatg	tagaatttgg	ttacagatta	tttgccaaag	gctgtttttt	cagagtaatt	1200
gacggcggaa	tggcatacca	tcaagaacca	cctggtaaag	aaaatgaaac	agaccgcgaa	1260
gctggtaaaa	gtattacgct	taaaattgtg	aaagaaaagg	taccttacat	ctatagaaag	1320
cttttaccaa	tagaagattc	acatattcat	agaatacctt	tagtttctat	ttatatcccc	1380
gcttataact	gtgcaaatta	tattcaaaga	tgtgtagata	gtgctcttaa	tcaaactggt	1440
gtcgatctcg	aggtttgtat	ttgtaacgat	ggttcaacag	ataatacctt	agaagtgatc	1500
aataagcttt	atggtaataa	tcctagggta	cgcacatgt	ctaaaccaa	tggcggaata	1560
gcctcagcat	caaatgcagc	cgtttctttt	gctaaagggt	attacattgg	gcagttagat	1620
tcagatgatt	atcttgagcc	tgatgcagtt	gaactgtggt	taaaagaatt	tttaaagat	1680
aaaacgctag	cttgtgttta	taccactaat	agaaacgtca	atccggatgg	tagcttaatc	1740
gctaattggt	acaattggcc	agaattttca	cgagaaaaac	tcacaacggc	tatgattgct	1800
caccatttta	gaatgtttac	gattagagct	tggcatttaa	cggatggatt	taacgaaaat	1860
attgaaaacg	ccgtggatta	tgacatgttc	cttaaactca	gtgaagttgg	aaaatttaaa	1920
catcttaata	aaatctgcta	taaccgcgta	ttacatgggtg	ataacacatc	cattaagaaa	1980
ctcggcattc	aaaagaaaaa	ccattttggt	gtagtcaatc	agtcattaaa	tagacaaggc	2040
atcaattatt	ataattatga	caaatttgat	gatttagatg	aaagtagaaa	gtatatcttc	2100
aataaaaccg	ctgaatatca	agaagaaatg	gatattttta	aagatcttaa	actcattcaa	2160
aataaagatg	ccaaaatcgc	agtcagtatt	ttctatccca	atacattaaa	cggcttagtg	2220
aaaaaactaa	acaatattat	tgaatataat	aaaaatatat	tcgttattat	tctacatggt	2280
gataagaatc	atcttacacc	agacatcaaa	aaagaaatat	tggttttcta	tcataagcac	2340
caagtgaata	ttttactaaa	taatgacatc	tcatattaca	cgagtaatag	actaataaaa	2400
actgaggcac	atttaagtaa	tattaataaa	ttaagtcagt	taaatctaaa	ttgtgaatac	2460
atcatttttg	ataatcatga	cagcctattc	gttaaaaaatg	acagctatgc	ttatatgaaa	2520
aaatatgatg	tcggcatgaa	tttctcagca	ttaacacatg	attggatcga	gaaaatcaat	2580
gcgcatccac	catttaaaaa	gctgattaaa	acctatttta	atgacaatga	cttaagaagt	2640
atgaatgtga	aaggggcatc	acaaggatg	tttatgaagt	atgcgctacc	gcatgagctt	2700
ctgacgatta	ttaaagaagt	catcacatcc	tgccaatcaa	ttgatagtgt	gccagaatat	2760
aacactgagg	atattttggt	ccaatttgca	cttttaatct	tagaaaagaa	aaccggccat	2820
gtatttaata	aaacatcgac	cctgacttat	atgccttggtg	aacgaaaatt	acaatggaca	2880
aatgaacaaa	ttcaaagtgc	aaaaaaaggc	gaaaatatcc	ccgttaacaa	gttcattatt	2940

aatagtataa cgctataaaa catttgcatt ttattaaaa

2979

<210> 4
<211> 965
<212> PRT
<213> Pasteurella multocida

<400> 4

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
35 40 45

Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
50 55 60

Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
65 70 75 80

Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
85 90 95

Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
100 105 110

Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
115 120 125

Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
130 135 140

Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
145 150 155 160

Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
165 170 175

Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
180 185 190

Glu Asn Leu Leu Thr Ile Val Gln Lys Tyr Glu Gln Lys Leu Asp Ile
195 200 205

Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys Ala Val Arg
Page 9

210	215	220
Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser Ile Leu Asp 225 230 235 240		
Cys Asp Met Ala Pro Gln Gln Leu Trp Val His Ser Tyr Leu Thr Glu 245 250 255		
Leu Leu Glu Asp Asn Asp Ile Val Leu Ile Gly Pro Arg Lys Tyr Val 260 265 270		
Asp Thr His Asn Ile Thr Ala Glu Gln Phe Leu Asn Asp Pro Tyr Leu 275 280 285		
Ile Glu Ser Leu Pro Glu Thr Ala Thr Asn Asn Asn Pro Ser Ile Thr 290 295 300		
Ser Lys Gly Asn Ile Ser Leu Asp Trp Arg Leu Glu His Phe Lys Lys 305 310 315 320		
Thr Asp Asn Leu Arg Leu Cys Asp Ser Pro Phe Arg Tyr Phe Ser Cys 325 330 335		
Gly Asn Val Ala Phe Ser Lys Glu Trp Leu Asn Lys Val Gly Trp Phe 340 345 350		
Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly Tyr 355 360 365		
Arg Leu Phe Ala Lys Gly Cys Phe Phe Arg Val Ile Asp Gly Gly Met 370 375 380		
Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg Glu 385 390 395 400		
Ala Gly Lys Ser Ile Thr Leu Lys Ile Val Lys Glu Lys Val Pro Tyr 405 410 415		
Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile His Arg Ile 420 425 430		
Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile 435 440 445		
Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu Glu 450 455 460		
Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile		

465		470		475		480
Asn Lys Leu Tyr	Gly 485	Asn Asn Pro Arg	Val 490	Arg Ile Met Ser	Lys 495	Pro
Asn Gly Gly Ile	Ala 500	Ser Ala Ser	Asn 505	Ala Ala Val Ser	Phe 510	Ala Lys
Gly Tyr Tyr	Ile 515	Gly Gln Leu	Asp 520	Ser Asp Asp Tyr	Leu 525	Glu Pro Asp
Ala Val	Glu 530	Leu Cys Leu	Lys 535	Glu Phe Leu Lys	Asp 540	Lys Thr Leu Ala
Cys Val	Tyr 545	Thr Thr	Asn 550	Arg Asn Val	Asn 555	Pro Asp Gly Ser Leu Ile 560
Ala Asn Gly Tyr	Asn 565	Trp Pro Glu Phe	Ser 570	Arg Glu Lys Leu	Thr 575	Thr
Ala Met Ile	Ala 580	His His Phe Arg	Met 585	Phe Thr Ile Arg	Ala 590	Trp His
Leu Thr	Asp 595	Gly Phe Asn Glu	Asn 600	Ile Glu Asn Ala	Val 605	Asp Tyr Asp
Met Phe	Leu 610	Lys Leu Ser	Glu 615	Val Gly Lys Phe	Lys 620	His Leu Asn Lys
Ile Cys Tyr	Asn 625	Arg Val	Leu 630	His Gly Asp	Asn 635	Thr Ser Ile Lys Lys 640
Leu Gly Ile	Gln 645	Lys Lys Asn His Phe	Val 650	Val Val Val	Asn 655	Gln Ser Leu
Asn Arg Gln	Gly 660	Ile Asn Tyr Tyr	Asn 665	Tyr Asp Lys Phe	Asp 670	Asp Leu
Asp Glu	Ser 675	Arg Lys Tyr Ile	Phe 680	Asn Lys Thr Ala	Glu 685	Tyr Gln Glu
Glu Met	Asp 690	Ile Leu Lys	Asp 695	Leu Lys Leu Ile	Gln 700	Asn Lys Asp Ala
Lys Ile Ala	Val 705	Ser Ile	Phe 710	Tyr Tyr Pro	Asn 715	Thr Leu Asn Gly Leu Val 720
Lys Lys Leu	Asn 725	Asn Ile Ile	Glu 730	Tyr Asn Lys	Asn 735	Ile Phe Val Ile

725	730	735
Ile Leu His Val Asp Lys Asn His Leu Thr Pro Asp Ile Lys Lys Glu		
740	745	750
Ile Leu Ala Phe Tyr His Lys His Gln Val Asn Ile Leu Leu Asn Asn		
755	760	765
Asp Ile Ser Tyr Tyr Thr Ser Asn Arg Leu Ile Lys Thr Glu Ala His		
770	775	780
Leu Ser Asn Ile Asn Lys Leu Ser Gln Leu Asn Leu Asn Cys Glu Tyr		
785	790	795
Ile Ile Phe Asp Asn His Asp Ser Leu Phe Val Lys Asn Asp Ser Tyr		
805	810	815
Ala Tyr Met Lys Lys Tyr Asp Val Gly Met Asn Phe Ser Ala Leu Thr		
820	825	830
His Asp Trp Ile Glu Lys Ile Asn Ala His Pro Pro Phe Lys Lys Leu		
835	840	845
Ile Lys Thr Tyr Phe Asn Asp Asn Asp Leu Arg Ser Met Asn Val Lys		
850	855	860
Gly Ala Ser Gln Gly Met Phe Met Lys Tyr Ala Leu Pro His Glu Leu		
865	870	875
Leu Thr Ile Ile Lys Glu Val Ile Thr Ser Cys Gln Ser Ile Asp Ser		
885	890	895
Val Pro Glu Tyr Asn Thr Glu Asp Ile Trp Phe Gln Phe Ala Leu Leu		
900	905	910
Ile Leu Glu Lys Lys Thr Gly His Val Phe Asn Lys Thr Ser Thr Leu		
915	920	925
Thr Tyr Met Pro Trp Glu Arg Lys Leu Gln Trp Thr Asn Glu Gln Ile		
930	935	940
Gln Ser Ala Lys Lys Gly Glu Asn Ile Pro Val Asn Lys Phe Ile Ile		
945	950	955
Asn Ser Ile Thr Leu		
965		

<211> 1851
 <212> DNA
 <213> *Pasteurella multocida*

<400> 5
 atgagcttat ttaaactgct tactgagcta ttttaagtcag gaaactataa agatgcacta 60
 actctatatg aaaatatagc taaaatttat gggttcagaaa gccttggttaa atataatatt 120
 gatatatgta aaaaaaatat aacacaatca aaaagtaata aaatagaaga agataatatt 180
 tctggagaaa acaaattttc agtatcaata aaagatctat ataacgaaat aagcaatagt 240
 gaattagggg ttacaaaaga aagactagga gccccccctc tagtcagtat tataatgact 300
 tctcataata cagaaaaatt cattgaagcc tcaattaatt cactattatt gcaaacatac 360
 aataacttag aagttatcgt tgtagatgat tatagcacag ataaaacatt tcagatcgca 420
 tccagaatag caaactctac aagtaaagta aaaacattcc gattaaactc aaatctaggg 480
 acatactttg cgaaaaatac aggaatttta aagtctaaag gagatattat tttctttcag 540
 gatagcgatg atgtatgtca ccatgaaaga atcgaaagat gtgttaatgc attattatcg 600
 aataaagata atatagctgt tagatgtgca tattctagaa taaatctaga aacacaaaat 660
 ataataaaag ttaatgataa taaatacaaa ttaggattaa taactttagg cgtttataga 720
 aaagtattta atgaaattgg tttttttaac tgcacaacca aagcatcgga tgatgaattt 780
 tatcatagaa taattaaata ctatggtaaa aataggataa ataacttatt tctaccactg 840
 tattataaca caatgcgtga agattcatta ttttctgata tggttgagtg ggtagatgaa 900
 aataatataa agcaaaaaac ctctgatgct agacaaaatt atctccatga attccaaaaa 960
 atacacaatg aaaggaaatt aaatgaatta aaagagattt ttagctttcc tagaattcat 1020
 gacgccttac ctatatcaaa agaaatgagt aagctcagca accctaaaat tcctgtttat 1080
 ataaatatat gctcaatacc ttcaagaata aaacaacttc aatacactat tggagtacta 1140
 aaaaaccaat gcgatcattt tcatatttat cttgatggat atccagaagt acctgatttt 1200
 ataaaaaac tagggaataa agcgaccgtt attaattgtc aaaacaaaaa tgagtctatt 1260
 agagataatg gaaagtttat tctattagaa aaacttataa aggaaaataa agatggatat 1320
 tatataactt gtgatgatga tatccggtat cctgctgact acacaaacac tatgataaaa 1380
 aaaattaata aatacaatga taaagcagca attggattac atggtgttat attcccaagt 1440
 agagtcaaca agtatttttc atcagacaga attgtctata attttcaaaa acctttagaa 1500
 aatgatactg ctgtaaatat attaggaact ggaactgttg ccttttagagt atctattttt 1560
 aataaatttt ctctatctga ttttgagcat cctggcatgg tagatatcta ttttctata 1620
 ctatgtaaga aaaacaatat actccaagtt tgtatatcac gaccatcgaa ttggctaaca 1680
 gaagataaca aaaacactga gaccttattt catgaattcc aaaatagaga tgaaatacaa 1740
 agtaaactca ttatttcaaa caacccttgg ggatactcaa gtatatatcc actattaaat 1800

aataatgcta attattctga acttattccg tgtttatctt ttataacga g

1851

<210> 6
<211> 615
<212> PRT
<213> Pasteurella multocida

<400> 6

Met Ser Leu Phe Lys Arg Ala Thr Glu Leu Phe Lys Ser Gly Asn Tyr
1 5 10 15

Lys Asp Ala Leu Thr Leu Tyr Glu Asn Ile Ala Lys Ile Tyr Gly Ser
20 25 30

Glu Ser Leu Val Lys Tyr Asn Ile Asp Ile Cys Lys Lys Asn Ile Thr
35 40 45

Gln Ser Lys Ser Asn Lys Ile Glu Glu Asp Asn Ile Ser Gly Glu Asn
50 55 60

Lys Phe Ser Val Ser Ile Lys Asp Leu Tyr Asn Glu Ile Ser Asn Ser
65 70 75 80

Glu Leu Gly Ile Thr Lys Glu Arg Leu Gly Ala Pro Pro Leu Val Ser
85 90 95

Ile Ile Met Thr Ser His Asn Thr Glu Lys Phe Ile Glu Ala Ser Ile
100 105 110

Asn Ser Leu Leu Leu Gln Thr Tyr Asn Leu Glu Val Ile Val Val Asp
115 120 125

Asp Tyr Ser Thr Asp Lys Thr Phe Gln Ile Ala Ser Arg Ile Ala Asn
130 135 140

Ser Thr Ser Lys Val Lys Thr Phe Arg Leu Asn Ser Asn Leu Gly Thr
145 150 155 160

Tyr Phe Ala Lys Asn Thr Gly Ile Leu Lys Ser Lys Gly Asp Ile Ile
165 170 175

Phe Phe Gln Ser Asp Asp Val Cys His His Glu Arg Ile Glu Arg Cys
180 185 190

Val Asn Ala Leu Leu Ser Asn Lys Asp Asn Ile Ala Val Arg Cys Ala
195 200 205

Tyr Ser Arg Ile Asn Leu Glu Thr Gln Asn Ile Ile Lys Val Asn Asp

210	215	220
Asn Lys Tyr Lys Leu Gly 225 230	Leu Ile Thr Leu Gly 235	Val Tyr Arg Lys Val 240
Phe Asn Glu Ile Gly 245	Phe Phe Asn Cys Thr 250	Thr Lys Ala Ser Asp 255
Glu Phe Tyr His Arg Ile Ile Lys Tyr Tyr Gly Lys Asn Arg Ile Asn 260 265		270
Asn Leu Phe Leu Pro Leu Tyr Tyr Asn Thr Met Arg Glu Asp Ser Leu 275 280 285		
Phe Ser Asp Met Val Glu Trp Val Asp Glu Asn Asn Ile Lys Gln Lys 290 295 300		
Thr Ser Asp Ala Arg Gln Asn Tyr Leu His Glu Phe Gln Lys Ile His 305 310 315 320		
Asn Glu Arg Lys Leu Asn Glu Leu Lys Glu Ile Phe Ser Phe Pro Arg 325 330 335		
Ile His Asp Ala Leu Pro Ile Ser Lys Glu Met Ser Lys Leu Ser Asn 340 345 350		
Pro Lys Ile Pro Val Tyr Ile Asn Ile Cys Ser Ile Pro Ser Arg Ile 355 360 365		
Lys Gln Leu Gln Tyr Thr Ile Gly Val Leu Lys Asn Gln Cys Asp His 370 375 380		
Phe His Ile Tyr Leu Asp Gly Tyr Pro Glu Val Pro Asp Phe Ile Lys 385 390 395 400		
Lys Leu Gly Asn Lys Ala Thr Val Ile Asn Cys Gln Asn Lys Asn Glu 405 410 415		
Ser Ile Arg Asp Asn Gly Lys Phe Ile Leu Leu Glu Lys Leu Ile Lys 420 425 430		
Glu Asn Lys Asp Gly Tyr Tyr Ile Thr Cys Asp Asp Asp Ile Arg Tyr 435 440 445		
Pro Ala Asp Tyr Thr Asn Thr Met Ile Lys Lys Ile Asn Lys Tyr Asn 450 455 460		
Asp Lys Ala Ala Ile Gly Leu His Gly Val Ile Phe Pro Ser Arg Val		

465 470 475 480
 Asn Lys Tyr Phe Ser Ser Asp Arg Ile Val Tyr Asn Phe Gln Lys Pro
 485 490 495
 Leu Glu Asn Asp Thr Ala Val Asn Ile Leu Gly Thr Gly Thr Val Ala
 500 505 510
 Phe Arg Val Ser Ile Phe Asn Lys Phe Ser Leu Ser Asp Phe Glu His
 515 520 525
 Pro Gly Met Val Asp Ile Tyr Phe Ser Ile Leu Cys Lys Lys Asn Asn
 530 535 540
 Ile Leu Gln Val Cys Ile Ser Arg Pro Ser Asn Trp Leu Thr Glu Asp
 545 550 555 560
 Asn Lys Asn Thr Glu Thr Leu Phe His Glu Phe Gln Asn Arg Asp Glu
 565 570 575
 Ile Gln Ser Lys Leu Ile Ile Ser Asn Asn Pro Trp Gly Tyr Ser Ser
 580 585 590
 Ile Tyr Pro Leu Leu Asn Asn Asn Ala Asn Tyr Ser Glu Leu Ile Pro
 595 600 605
 Cys Leu Ser Phe Tyr Asn Glu
 610 615

<210> 7
 <211> 1940
 <212> DNA
 <213> Pasteurella multocida

<400> 7
 aacaggggat aaggtcagta aatttaggat gatttttgac taatggataa atacttgaat 60
 atcccatgg accgttttcc atgacagct gagtttggtg ctcattcattg tctcgatatt 120
 gatgatagag tgtttcgctg tctctattat cttccgtag ccagtttgct ggtcttgaaa 180
 tacaaatctg aagaatatta tttttcttac acaagagaga gaaatagata tcagccatgc 240
 ctgaatgggt aaagtcagaa agagaaaatt gattaaagag actgactcta aagctaacag 300
 ttctgtacc taatacattg accgctttgt ctttttccag aggtttatag aagctatata 360
 ccagtctatc cgccgaaaaa tatttggtca ttctacttgg aaagagaatg ccgtgtaaac 420
 caataaccgc tttatcatcg tattcattca gcttcttgat catcgtattg atgtaatcgc 480
 ttggatagat aatgtcatca tcacagggtta tataatatcc atcttgattt ttttcaatca 540
 actcttccag taaaatgaat ttgccattat ctctaattga gttatcttta tctttgcaat 600

gaacaacggt tgctttatta cctaaatfff ttatgaagtc agggatttct acatagccat 660
 caagataaat atgaaaatga tcacattgat tttttagtat gccgataata cgtcgttaatt 720
 gcgctattct tgagggaata gaacaaatat tgatataaac aggaatctta ggattggaca 780
 acttactcat ttcttggtgt actggtaagg catcgtaaata acgaggggaat tgaaaaagat 840
 ttttgaaatc atgtgaggca gtttcgttat gcatcgcttg aaacaggggt gcataatggt 900
 gtctggtatc agacattttc tgtattatgt tatgattgtc tatccattca accatatcag 960
 taaataaaga gttttctctc attgtgttgt agtataacgg caagagtaaa ttttttattt 1020
 tttcttttcc ataataattc gcaattctat gaaaaaactc atcatctgag ctttttagtcg 1080
 tacaattgaa gaaaccaatt tcttgaaata cttttctgtg catacccaag gttataaaac 1140
 ctaatctata atccatatta ttgactttta tgatatgttg tgtttctggt gctagtcttg 1200
 agtatgcaca acgaacagca atagtttctt tattagctaa taatatattt acacatcttt 1260
 ctattctttc atgatgacat acatcatcac tatcttgaaa gaaaataatg tcacctttag 1320
 attttaatat gcctgtattt ttcgcaaagt aagttcctag gtttgaattt aatctaaata 1380
 ctctgacttt gcttggtgta ttcgctattc tcgaggcaat ttcaaataga ttatccgagc 1440
 tatcatcatc tacaataata atttctatgt ttttatatgt ttgtaacaat aatgaattaa 1500
 tagaagcttc gataaattgc gctgtattgt gagatgtcat gataaactg actaatggat 1560
 ttacgctggt ggtttctttg actaacccta aatcactttt agcgacttca ttatataaat 1620
 ctgttattga tgttgtttgc ttatcttttt ctagctttgc ttctaatagct tgattatagg 1680
 tatatatattt ttcaaattct tgcagaacca attggagtgt ttttaataaa agtttatttt 1740
 cgttttcaag ggatgcggat agcggatgtt tactgtcctg ttttgccaat aaagtttggt 1800
 gagaaataat gtctttgttt aaagttgttt ttagactatc aattttattt tgaaagggtg 1860
 tgagttcatt ttctttttca tgttgggggg gatttttagt catttgtttt tgagtcattc 1920
 ctttttttct cttcatttca 1940

<210> 8
 <211> 651
 <212> PRT
 <213> *Pasteurella multocida*

<400> 8

Met Lys Arg Lys Lys Glu Met Thr Gln Lys Gln Met Thr Lys Asn Pro
 1 5 10 15

Pro Gln His Glu Lys Glu Asn Glu Leu Asn Thr Phe Gln Asn Lys Ile
 20 25 30

Asp Ser Leu Lys Thr Thr Leu Asn Lys Asp Ile Ile Ser Gln Gln Thr
 Page 17

35					40					45				
Leu 50	Ala	Lys	Gln	Asp	Ser 55	Lys	His	Pro	Leu	Ser 60	Ala	Ser	Leu	Glu
Asn 65	Glu	Asn	Lys	Leu 70	Leu	Leu	Lys	Gln	Leu	Gln 75	Leu	Val	Leu	Gln 80
Phe	Glu	Lys	Ile 85	Tyr	Thr	Tyr	Asn	Gln	Ala 90	Leu	Glu	Ala	Lys	Leu 95
Lys	Asp	Lys	Gln 100	Thr	Thr	Ser	Ile	Thr 105	Asp	Leu	Tyr	Asn	Glu 110	Val
Lys	Ser	Asp 115	Leu	Gly	Leu	Val	Lys 120	Glu	Thr	Asn	Ser	Val 125	Asn	Pro
Val	Ser 130	Ile	Ile	Met	Thr	Ser 135	His	Asn	Thr	Ala	Gln 140	Phe	Ile	Glu
Ser 145	Ile	Asn	Ser	Leu	Leu 150	Leu	Gln	Thr	Tyr	Lys 155	Asn	Ile	Glu	Ile 160
Ile	Val	Asp	Asp	Asp 165	Ser	Ser	Asp	Asn	Thr 170	Phe	Glu	Ile	Ala	Ser 175
Ile	Ala	Asn	Thr 180	Thr	Ser	Lys	Val	Arg 185	Val	Phe	Arg	Leu	Asn 190	Ser
Leu	Gly	Thr 195	Tyr	Phe	Ala	Lys	Asn 200	Thr	Gly	Ile	Leu	Lys 205	Ser	Lys
Asp	Ile 210	Ile	Phe	Phe	Gln	Asp 215	Ser	Asp	Asp	Val	Cys 220	His	His	Glu
Ile 225	Glu	Arg	Cys	Val	Asn 230	Ile	Leu	Leu	Ala	Asn 235	Lys	Glu	Thr	Ile 240
Val	Arg	Cys	Ala	Tyr 245	Ser	Arg	Leu	Ala	Pro 250	Glu	Thr	Gln	His	Ile 255
Lys	Val	Asn	Asn 260	Met	Asp	Tyr	Arg	Leu 265	Gly	Phe	Ile	Thr	Leu 270	Gly
His	Arg	Lys 275	Val	Phe	Gln	Glu	Ile 280	Gly	Phe	Phe	Asn	Cys 285	Thr	Thr
Gly	Ser	Asp	Asp	Glu	Phe	Phe	His	Arg	Ile	Ala	Lys	Tyr	Tyr	Gly

290	295	300
Glu 305	Lys Ile Lys Asn 310	Leu Leu Pro Leu Tyr Tyr Asn Thr Met Arg 315 320
Glu Asn Ser Leu Phe 325	Thr Asp Met Val 330	Glu Trp Ile Asp Asn His Asn 335
Ile Ile Gln Lys 340	Met Ser Asp Thr Arg 345	Gln His Tyr Ala Thr Leu Phe 350
Gln Ala Met His Asn Glu Thr 355	Ala Ser His Asp Phe 365	Lys Asn Leu Phe 365
Gln Phe Pro Arg Ile Tyr Asp 370 375	Ala Leu Pro Val	Pro Gln Glu Met Ser 380
Lys Leu Ser Asn Pro Lys 385 390	Ile Pro Val Tyr Ile	Asn Ile Cys Ser Ile 395 400
Pro Ser Arg Ile Ala 405	Gln Leu Arg Arg Ile 410	Ile Gly Ile Leu Lys Asn 415
Gln Cys Asp His Phe His Ile Tyr 420	Leu Asp Gly Tyr Val 425	Glu Ile Pro 430
Asp Phe Ile Lys Asn Leu Gly 435	Asn Lys Ala Thr Val 440	Val His Cys Lys 445
Asp Lys Asp Asn Ser Ile Arg 450 455	Asp Asn Gly Lys Phe	Ile Leu Leu Glu 460
Glu Leu Ile Glu Lys Asn 465 470	Gln Asp Gly Tyr Tyr	Ile Thr Cys Asp Asp 475 480
Asp Ile Ile Tyr Pro 485	Ser Asp Tyr Ile Asn	Thr Met Ile Lys Lys Leu 490 495
Asn Glu Tyr Asp Asp Lys Ala Val 500	Ile Gly Leu His Gly	Ile Leu Phe 510
Pro Ser Arg Met Thr Lys Tyr Phe 515 520	Ser Ala Asp Arg	Leu Val Tyr Ser 525
Phe Tyr Lys Pro Leu Glu Lys 530 535	Asp Lys Ala Val	Asn Val Leu Gly Thr 540
Gly Thr Val Ser Phe Arg Val Ser Leu	Phe Asn Gln Phe Ser Leu Ser	

545 550 555 560

Asp Phe Thr His Ser Gly Met Ala Asp Ile Tyr Phe Ser Leu Leu Cys
565 570 575

Lys Lys Asn Asn Ile Leu Gln Ile Cys Ile Ser Arg Pro Ala Asn Trp
580 585 590

Leu Thr Glu Asp Asn Arg Asp Ser Glu Thr Leu Tyr His Gln Tyr Arg
595 600 605

Asp Asn Asp Glu Gln Gln Thr Gln Leu Ile Met Glu Asn Gly Pro Trp
610 615 620

Gly Tyr Ser Ser Ile Tyr Pro Leu Val Lys Asn His Pro Lys Phe Thr
625 630 635 640

Asp Leu Ile Pro Cys Leu Pro Phe Tyr Phe Leu
645 650

<210> 9
<211> 703
<212> PRT
<213> Pasteurella multocida

<400> 9

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
85 90 95

Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
100 105 110

Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
210 215 220

Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
225 230 235 240

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
245 250 255

Val His Ser Tyr Val Ala Glu Leu Leu Glu Asp Asp Asp Leu Thr Ile
260 265 270

Ile Gly Pro Arg Lys Tyr Ile Asp Thr Gln His Ile Asp Pro Lys Asp
275 280 285

Phe Leu Asn Asn Ala Ser Leu Leu Glu Ser Leu Pro Glu Val Lys Thr
290 295 300

Asn Asn Ser Val Ala Ala Lys Gly Glu Gly Thr Val Ser Leu Asp Trp
305 310 315 320

Arg Leu Glu Gln Phe Glu Lys Thr Glu Asn Leu Arg Leu Ser Asp Ser
325 330 335

Pro Phe Arg Phe Phe Ala Ala Gly Asn Val Ala Phe Ala Lys Lys Trp
340 345 350

Leu Asn Lys Ser Gly Phe Phe Asp Glu Glu Phe Asn His Trp Gly Gly
355 360 365

Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Arg Tyr Gly Ser Phe Phe
370 375 380

Lys Thr Ile Asp Gly Ile Met Ala Tyr His Gln Glu Pro Pro Gly Lys
385 390 395 400

Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Asn Ile Thr Leu Asp Ile
405 410 415

Met Arg Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu
420 425 430

Asp Ser His Ile Asn Arg Val Pro Leu Val Ser Ile Tyr Ile Pro Ala
435 440 445

Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn
450 455 460

Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr
465 470 475 480

Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg
485 490 495

Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn
500 505 510

Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser
515 520 525

Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe
530 535 540

Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val
545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe
565 570 575

Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met
580 585 590

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Lys Ile
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
625 630 635 640

Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
645 650 655

Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Thr Tyr Tyr Asn
660 665 670

Tyr Asp Glu Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
675 680 685

Lys Thr Ala Glu Tyr Gln Glu Glu Ile Asp Ile Leu Lys Asp Ile
690 695 700

<210> 10
<211> 1953
<212> DNA
<213> Pasteurella multocida

<400> 10
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat 180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt 240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca 360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca 420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt 480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat 780
gttgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat 840
acacaacata ttgacccaa agacttctta aataacgcga gtttgcttga atcattacca 900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg 960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt 1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat 1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac 1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa 1200

gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggttaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caa	1953

<210> 11
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 11	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgtttaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagac tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaagggggaag gaacagtttc tctggattgg	960

cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcataatcaa tagagtacct	1320
ttagttttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggttttga tttgtaacaa tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 12
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 12	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtagaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480

tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagataatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcaactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaattgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 13
 <211> 1614
 <212> DNA
 <213> *Pasteurella multocida*

<400> 13	
atcaatagag tacctttagt ttcaatttat atcccagctt ataactgtgc aaactatatt	60

caacgttgcg tagatagtgc actgaatcag actgttgttg atctcgaggt ttgtatttgt	120
aacgatggtt caacagataa taccttagaa gtgatcaata agctttatgg taataatcct	180
agggtagcga tcatgtctaa accaaatggc ggaatagcct cagcatcaaa tgcagccgtt	240
tcttttgcta aaggttatta cattgggcag ttagattcag atgattatct tgagcctgat	300
gcagttgaac tgtgtttaaa agaattttta aaagataaaa cgctagcttg tgtttatacc	360
actaatagaa acgtcaatcc ggatggtagc ttaatcgcta atgggttaca ttggccagaa	420
ttttcacgag aaaaactcac aacggctatg attgctcacc actttagaat gttcacgatt	480
agagcttggc atttaactga tggattcaat gaaaaaattg aaaatgccgt agactatgac	540
atgttcctca aactcagtga agttggaaaa tttaaaccatc ttaataaaat ctgctataac	600
cgtgtattac atgggtgata cacatcaatt aagaaacttg gcattcaaaa gaaaaacat	660
tttgttgtag tcaatcagtc attaaataga caaggcataa cttattataa ttatgacgaa	720
tttgatgatt tagatgaaag tagaaagtat attttcaata aaaccgctga atatcaagaa	780
gagattgata tcttaaaaga tattaanaatc atccagaata aagatgccaa aatcgagtc	840
agtatttttt atcccaatac attaaacggc ttagtgaaaa aactaaacaa tattattgaa	900
tataataaaa atatattcgt tattgttcta catgttgata agaatcatct tacaccagat	960
atcaaaaaag aaatactagc cttctatcat aaacatcaag tgaatatttt actaaataat	1020
gatatctcat attacacgag taatagatta ataaaaactg aggcgcattt aagtaatatt	1080
aataaattaa gtcagttaaa tctaaattgt gaatacatca tttttgataa tcatgacagc	1140
ctattcgtaa aaaatgacag ctatgcttat atgaaaaaat atgatgtcgg catgaatttc	1200
tcagcattaa cacatgattg gatcgagaaa atcaatgcgc atccaccatt taaaaagctc	1260
attaaaactt attttaatga caatgactta aaaagtatga atgtgaaagg ggcattcaca	1320
ggatatgttta tgacgtatgc gctagcgcag gagcttctga cgattattaa agaagtcac	1380
acatcttgcc agtcaattga tagtgtgcca gaatataaca ctgaggatat ttggttccaa	1440
tttgcacttt taatcttaga aaagaaaacc ggccatgtat ttaataaaac atcgaccctg	1500
acttatatgc cttgggaacg aaaattacaa tggacaaatg aacaaattga aagtgcacaa	1560
agaggagaaa atatacctgt taacaagttc attattaata gtataactct ataa	1614

<210> 14
 <211> 966
 <212> DNA
 <213> *Pasteurella multocida*

<400> 14	
atcaatagag tacctttagt ttcaatttat atcccagctt ataactgtgc aaactatatt	60
caacgttgcg tagatagtgc actgaatcag actgttgttg atctcgaggt ttgtatttgt	120

aacgatggtt caacagataa taccttagaa gtgatcaata agctttatgg taataatcct	180
agggtacgca tcatgtctaa accaaatggc ggaatagcct cagcatcaaa tgcagccgtt	240
tcttttgcta aaggttatta cattgggcag ttagattcag atgattatct tgagcctgat	300
gcagttgaac tgtgtttaaa agaattttta aaagataaaa cgctagcttg tgtttataacc	360
actaatagaa acgtcaatcc ggatggtagc ttaatcgcta atggttacaa ttggccagaa	420
ttttcacgag aaaaactcac aacggctatg attgctcacc actttagaat gttcacgatt	480
agagcttggc atttaactga tggattcaat gaaaaaattg aaaatgccgt agactatgac	540
atgttcctca aactcagtga agttggaaaa tttaaacatc ttaataaaat ctgctataac	600
cgtgtattac atgggtgataa cacatcaatt aagaaacttg gcattcaaaa gaaaaaccat	660
tttgttgtag tcaatcagtc attaaataga caaggcataa cttattataa ttatgacgaa	720
tttgatgatt tagatgaaag tagaaagtat attttcaata aaaccgctga atatcaagaa	780
gagattgata tcttaaaaga tattaacatc atccagaata aagatgccaa aatcgcagtc	840
agtatTTTTT atcccaatac attaaacggc ttagtgaaaa aactaaacaa tattattgaa	900
tataataaaa atatattcgt tattgttcta catgttgata agaatcatct tacaccagat	960
atctaa	966

<210> 15
 <211> 1821
 <212> DNA
 <213> *Pasteurella multocida*

<400> 15	
atgaaacctg aacatcaaca tgttggtctt tctattatcg ttacaacatt caatcgacca	60
gcaatTTTat cgattacatt agcctgttta gtaaaccaaa aaacacatta cccgtttgaa	120
gttatcgtga cagatgatgg tagtcaggaa gatctatcac cgatcattcg ccaatatgaa	180
aataaattgg atattcgcta cgtcagacaa aaagataacg gttttcaagc cagtgccgct	240
cggaatatgg gattacgctt agcaaaatat gactttattg gcttactcga ctgtgatatg	300
gcgccaaatc cattatgggt tcattcttat gttgcagagc tattagaaga tgatgattta	360
acaatcattg gtccaagaaa atacatcgat acacaacata ttgacccaaa agacttctta	420
aataacgca gtttgcttga atcattacca gaagtgaaaa ccaataatag tgttgccgca	480
aaaggggaag gaacagtttc tctggattgg cgcttagaac aattcgaaaa aacagaaaat	540
ctccgcttat ccgattcgcc tttccgtttt tttgcggcgg gtaatgttgc tttcgctaaa	600
aaatggctaa ataaatccgg tttctttgat gaggaattta atcactgggg tggagaagat	660
gtggaatttg gatatcgctt attccgttac ggtagtttct ttaaaactat tgatggcatt	720
atggcctacc atcaagagcc accaggtaaa gaaaatgaaa ccgatcgtga agcgggaaaa	780
aatattacgc tcgatattat gagagaaaag gtcccttata tctatagaaa acttttacca	840

atagaagatt cgcatatcaa tagagtacct ttagtttcaa tttatatccc agcttataac	900
tgtgcaaact atattcaacg ttgcgtagat agtgcactga atcagactgt tgttgatctc	960
gaggtttgta tttgtaacga tggttcaaca gataatacct tagaagtgat caataagctt	1020
tatggtaata atcctagggg acgcatcatg tctaaaccaa atggcggaat agcctcagca	1080
tcaaatgcag ccgtttcttt tgctaaaggt tattacattg ggcagttaga ttcagatgat	1140
tatcttgagc ctgatgcagt tgaactgtgt ttaaaagaat ttttaaaaga taaaacgcta	1200
gcttggtgtt ataccactaa tagaaacgtc aatccggatg gtagcttaat cgctaattgt	1260
tacaattggc cagaattttc acgagaaaaa ctcacaacgg ctatgattgc tcaccacttt	1320
agaatgttca cgattagagc ttggcattta actgatggat tcaatgaaaa aattgaaaat	1380
gccgtagact atgacatggt cctcaaactc agtgaagttg gaaaatttaa acatcttaat	1440
aaaatctgct ataaccgtgt attacatggg gataacacat caattaagaa acttggcatt	1500
caaaagaaaa accattttgt tgtagtcaat cagtcattaa atagacaagg cataacttat	1560
tataattatg acgaatttga tgatttagat gaaagtagaa agtatatttt caataaaacc	1620
gctgaatatc aagaagagat tgatatctta aaagatatta aaatcatcca gaataaagat	1680
gccaaaatcg cagtcagtat tttttatccc aatacattaa acggcttagt gaaaaaacta	1740
aacaatatta ttgaatataa taaaaatata ttcgttattg ttctacatgt tgataagaat	1800
catcttacac cagatatcta a	1821

<210> 16
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 16	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaa	180
aaagaagaaa aagtcaatgt ttgcgtagat ccgtagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtagca	360
aaagattttc ccaagatctt ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgaagg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660

aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaa	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tgggtcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagg	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 17
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 17	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240

tccaacgtaa	aaaaattagt	actttctgac	tcggaaaaaa	acacgttaaa	aaataaatgg	300
aaattgctca	ctgagaagaa	atctgaaaat	gcggaggtaa	gagcggtcgc	ccttgtacca	360
aaagattttc	ccaaagatct	ggtttttagcg	cctttacctg	atcatgttaa	tgattttaca	420
tggtacaaaa	agcgaaagaa	aagacttggc	ataaaacctg	aacatcaaca	tgttggctct	480
tctattatcg	ttacaacatt	caatcgacca	gcaattttat	cgattacatt	agcctgttta	540
gtaaaccaa	aaacacatta	cccgtttgaa	gttatcgtga	cagataaagg	tagtcaggaa	600
gatctatcac	cgatcattcg	ccaatatgaa	aataaattgg	atattcgcta	cgtcagacaa	660
aaagataacg	gttttcaagc	cagtgccgct	cggaatatgg	gattacgctt	agcaaaatat	720
gactttattg	gcttactcga	ctgtgatatg	gcgccaaatc	cattatgggt	tcattcttat	780
gttcgagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgacccaaa	agacttctta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tgttgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgcggcgg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tgagagaagat	gtggaatttg	gatatcgctt	attccgttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgcactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggt	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaagggt	1560
tattacattg	ggcagttaga	ttcagatgat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgtc	1680
aatccggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacaacgg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatggt	cctcaaactc	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatgggt	1920
gataacacat	caattaagaa	acttggcatt	caaaagaaaa	accattttgt	tgtagtcaat	1980
cagtcattaa	atagacaagg	cataacttat	tataattatg	acgaatttga	tgatttagat	2040
gaaagtagaa	agtatatttt	caataaaacc	gctgaatatc	aagaagagat	tgatatctta	2100
aaagatatatt	aa					2112

<210> 18
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 18
 atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
 aaattatattg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
 aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat 180
 aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt 240
 tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
 aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtagca 360
 aaagattttc ccaaagatct ggtttttagcg cctttacctg atcatgttaa tgattttaca 420
 tggtagaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttgggtctt 480
 tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
 gtaaaccaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
 gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
 aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720
 gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat 780
 gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat 840
 acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca 900
 gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg 960
 cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt 1020
 tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat 1080
 gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac 1140
 ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa 1200
 gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag 1260
 gtcccttata tctatagaaa acttttacca atagaagatt cgcatatcaa tagagtacct 1320
 ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat 1380
 agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga aggttcaaca 1440
 gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg 1500
 tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt 1560
 tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt 1620
 ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc 1680

aatccggatg gtagcttaat cgctaattggt tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 19
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 19	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260

gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagttttcaa tttatatccc agctttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacaa aggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacacggt ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 20
 <211> 2271
 <212> DNA
 <213> *Pasteurella multocida*

<400> 20	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttgggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780

gttgagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgacccaaa	agactttctta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tgttgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgcggcgg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tggagaagat	gtggaatttg	gatatcgctt	attccgttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagttttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgcactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggg	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaaggt	1560
tattacattg	ggcagttaga	ttcagatgat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgtc	1680
aatccgggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacaacgg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatggt	cctcaaaactc	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatggg	1920
gataacacat	caattaagaa	acttggcatt	caaaagaaaa	accattttgt	tgtagtcaat	1980
cagtcattaa	atagacaagg	cataacttat	tataattatg	acgaatttga	tgatttagat	2040
gaaagtagaa	agtatatatt	caataaaacc	gctgaatatc	aagaagagat	tgatatctta	2100
aaagatatta	aaatcatcca	gaataaagat	gccaaaatcg	cagtcagtat	tttttatccc	2160
aatacattaa	acggcttagt	gaaaaaacta	aacaatatta	ttgaatataa	taaaaatata	2220
ttcgttattg	ttctacatgt	tgataagaat	catcttacac	cagatatcta	a	2271

<210> 21
 <211> 1704
 <212> DNA
 <213> Pasteurella multocida

<400>	21					
atgaatacat	tatcacaagc	aataaaagca	tataacagca	atgactatca	attagcactc	60
aaattatttg	aaaagtcggc	ggaaatctat	ggacggaaaa	ttgttgaatt	tcaaattacc	120
aaatgcaaag	aaaaactctc	agcacatcct	tctgttaatt	cagcacatct	ttctgtaaat	180
aaagaagaaa	aagtcaatgt	ttgcgatagt	ccgttagata	ttgcaacaca	actgttactt	240

tccaacgtaa	aaaaattagt	actttctgac	tcggaaaaaa	acacgttaaa	aaataaatgg	300
aaattgctca	ctgagaagaa	atctgaaaat	gcggaggtaa	gagcggtcgc	ccttgtacca	360
aaagattttc	ccaaagatct	ggtttttagcg	cctttacctg	atcatgttaa	tgattttaca	420
tggtacaaaa	agcgaaagaa	aagacttggc	ataaaacctg	aacatcaaca	tgttggtctt	480
tctattatcg	ttacaacatt	caatcgacca	gcaattttat	cgattacatt	agcctgttta	540
gtaaaccaa	aaacacatta	cccgtttgaa	gttatcgtga	cagatgatgg	tagtcaggaa	600
gatctatcac	cgatcattcg	ccaatatgaa	aataaattgg	atattcgcta	cgtcagacaa	660
aaagataacg	gttttcaagc	cagtgccgct	cggaatatgg	gattacgctt	agcaaaatat	720
gactttattg	gcttactcga	ctgtgatatg	gcgccaaatc	cattatgggt	tcattcttat	780
gttcgagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgaccctaa	agacttctta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tgttgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgcggcgg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tggaagaagat	gtggaatttg	gatatcgctt	attccgttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgcactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggt	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaagggt	1560
tattacattg	ggcagttaga	ttcagatgat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgct	1680
aatccggatg	gtagcttaat	ctaa				1704

<210> 22
 <211> 18
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic peptide based on residues 526-543 of pmHAS
 <400> 22

Leu	Asp	Ser	Asp	Asp	Tyr	Leu	Glu	Pro	Asp	Ala	Val	Glu	Leu	Cys	Leu
1				5					10					15	

Lys Glu

<210> 23
 <211> 24
 <212> DNA
 <213> Artificial sequence

<220>
 <223> primer Pm10

<400> 23
 cactgtctaa ctttattggt agcc 24

<210> 24
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer Pm21

<400> 24
 tttttaacga ataggctgtc 20

<210> 25
 <211> 19
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic peptide based on residues 526 to 544 of pmHAS protein

<400> 25

Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu
 1 5 10 15

Lys Glu Phe

<210> 26
 <211> 2115
 <212> DNA
 <213> Pasteurella multocida

<400> 26
 atgaatacat tatcacaagc aataaaagca tataacagca atgactatga attagcactc 60
 aaattattttg agaagtctgc tgaaacctac gggcgaaaaa tcgttgaatt ccaaattatc 120
 aaatgtaaag aaaaactctc gaccaattct tatgtaagtg aagataaaaa aaacagtgtt 180
 tgcgatagct cattagatat cgcaacacag ctcttacttt ccaacgtaaa aaaattaact 240
 ctatccgaat cagaaaaaaa cagtttaaaa aataaatgga aatctatcac tgggaaaaaa 300

tcggagaacg cagaaatcag aaaggtggaa ctagtaccca aagattttcc taaagatctt	360
gttcttgctc cattgccaga tcatgttaat gattttacat ggtacaaaaa tcgaaaaaaa	420
agcttaggta taaagcctgt aaataagaat atcgggtcttt ctattattat tcctacattt	480
aatcgtagcc gtatttttaga tataacgtta gcctgtttgg tcaatcagaa aacaaactac	540
ccatttgaag tcgttggtgc agatgatggg agtaaggaaa acttacttac cattgtgcaa	600
aaatacgaac aaaaacttga cataaagtat gtaagacaaa aagattatgg atatcaattg	660
tgtgcagtca gaaacttagg tttagctaca gcaaagtatg attttgtctc gattctagac	720
tgcgatatgg caccacaaca attatgggtt cattcttatt ttacagaact attagaagac	780
aatgatattg ttttaattgg acctagaaaa tatgtggata ctcataatat taccgcagaa	840
caattcctta acgatccata tttaatagaa tctactacctg aaaccgctac aaataacaat	900
ccttcgatta catcaaaagg aaatatatcg ttggattgga gattagaaca tttcaaaaaa	960
accgataatc tacgtctatg tgattctccg tttcgttatt ttagttgctg taatgttgca	1020
ttttctaaag aatggctaaa taaagtaggt tggttcgatg aagaatttaa tcattggggg	1080
ggcgaagatg tagaatttgg ttacagatta tttgccaaag gctgtttttt cagagtaatt	1140
gacggcggaa tggcatacca tcaagaacca cctggtaaag aaaatgaaac agaccgcgaa	1200
gctggtaaaa gtattacgct taaaattgtg aaagaaaagg taccttacat ctatagaaag	1260
cttttaccba tagaagattc acatattcat agaatacctt tagtttctat ttatatcccc	1320
gcttataact gtgcaaatta tattcaaaga tgtgtagata gtgctcttaa tcaaactgtt	1380
gtcgatctcg aggtttgtat ttgtaacgat ggttcaacag ataatacctt agaagtgatc	1440
aataagcttt atggtaataa tcctagggta cgcacatcatg ctaaaccaaa tggcgggaata	1500
gcctcagcat caaatgcagc cgtttctttt gctaaagggtt attacattgg gcagttagat	1560
tcagatgatt atcttgagcc tgatgcagtt gaactgtgtt taaaagaatt tttaaaagat	1620
aaaacgctag cttgtgttta taccactaat agaaacgtca atccggatgg tagcttaatc	1680
gctaattggtt acaattggcc agaattttca cgagaaaaac tcacaacggc tatgattgct	1740
caccatttta gaatgtttac gattagagct tggcatttaa cggatggatt taacgaaaat	1800
attgaaaacg ccgtggatta tgacatgttc cttaaactca gtgaagttgg aaaattttaa	1860
catcttaata aaatctgcta taaccgcgta ttacatggtg ataacacatc cattaagaaa	1920
ctcggcattc aaaagaaaaa ccattttgtt gtagtcaatc agtcattaaa tagacaaggc	1980
atcaattatt ataattatga caaatttgat gatttagatg aaagtagaaa gtatatcttc	2040
aataaaaccg ctgaatatca agaagaaatg gatattttta aagatcttaa actcattcaa	2100
aataaagatg cctaa	2115

<211> 1980
 <212> DNA
 <213> *Pasteurella multocida*

<400> 27
 atgctctcag cacatccttc tgttaattca gcacatcttt ctgtaaataa agaagaaaaa 60
 gtcaatgttt gcgatagtcg gtttagatatt gcaacacaac tgttactttc caacgtaaaa 120
 aaattagtagc tttctgactc ggaaaaaaac acgttaaaaa ataaatggaa attgctcact 180
 gagaagaaat ctgaaaatgc ggaggtaaga gcggtcgccc ttgtaccaa agattttccc 240
 aaagatctgg ttttagcgcc tttacctgat catgttaatg attttacctg gtacaaaaag 300
 cgaaagaaaa gacttggcat aaaacctgaa catcaacatg ttggtctttc tattatcggt 360
 acaacattca atcgaccagc aattttatcg attacattag cctgtttagt aaacaaaaa 420
 acacattacc cgtttgaagt tatcgtgaca gatgatggta gtcaggaaga tctatcaccg 480
 atcattcgcc aatatgaaaa taaattggat attcgctacg tcagacaaaa agataacggt 540
 tttcaagcca gtgccgctcg gaatatggga ttacgcttag caaaatatga ctttattggc 600
 ttactcgact gtgatatggc gccaaatcca ttatgggttc attcttatgt tgcagagcta 660
 ttagaagatg atgatttaac aatcattggt ccaagaaaat acatcgatac acaacatatt 720
 gacccaaaag acttcttaaa taacgcgagt ttgcttgaat cattaccaga agtgaaaacc 780
 aataatagtg ttgccgcaaa aggggaagga acagtttctc tggattggcg cttagaacaa 840
 ttcgaaaaaa cagaaaatct ccgcttatcc gattcgctt tccgtttttt tgcggcgggt 900
 aatgttgctt tcgctaaaaa atggctaaat aaatccggtt tctttgatga ggaatttaat 960
 cactgggggtg gagaagatgt ggaatttgga tatcgcttat tccgttacgg tagtttcttt 1020
 aaaactattg atggcattat ggcctaccat caagagccac caggtaaaga aaatgaaacc 1080
 gatcgtgaag cgggaaaaaa tattacgctc gatattatga gagaaaaggc cccttatatc 1140
 tatagaaaac ttttaccat agaagattcg catatcaata gagtacctt agtttcaatt 1200
 tatatcccag cttataactg tgcaaaactat attcaacgtt gcgtagatag tgcactgaat 1260
 cagactgttg ttgatctcga ggtttgtatt tgtaacgatg gttcaacaga taatacctta 1320
 gaagtgatca ataagcttta tggtataaat cctagggtag gcatcatgtc taaaccaa 1380
 ggcggaatag cctcagcatc aaatgcagcc gtttcttttg cttaaaggta ttacattggg 1440
 cagttagatt cagatgatta tcttgagcct gatgcagttg aactgtgttt aaaagaattt 1500
 ttaaaagata aaacgctagc ttgtgtttat accactaata gaaacgtcaa tccggatggg 1560
 agcttaatcg ctaatggta caattggcca gaattttcac gagaaaaact cacaacggct 1620
 atgattgctc accactttag aatgttcacg attagagctt ggcatttaac tgatggattc 1680
 aatgaaaaaa ttgaaaatgc cgtagactat gacatgttcc tcaaactcag tgaagttgga 1740
 aaatttaaac atcttaataa aatctgctat aaccgtgtat tacatggtga taacacatca 1800

attaagaaac ttggcattca aaagaaaaac cattttgttg tagtcaatca gtcattaaat	1860
agacaaggca taacttatta taattatgac gaatttgatg atttagatga aagtagaaag	1920
tatattttca ataaaaccgc tgaatatcaa gaagagattg atatcttaaa agatatttaa	1980

<210> 28
 <211> 1902
 <212> DNA
 <213> *Pasteurella multocida*

<400> 28	
atgttagata ttgcaacaca actgttactt tccaacgtaa aaaaattagt actttctgac	60
tcggaaaaaa acacgttaaa aaataaatgg aaattgctca ctgagaagaa atctgaaaat	120
gcggaggtaa gagcggtcgc ccttgtacca aaagattttc ccaaagatct ggtttttagcg	180
cctttacctg atcatgttaa tgattttaca tggtaaaaa agcgaagaa aagacttggc	240
ataaaacctg aacatcaaca tgttggctct tctattatcg ttacaacatt caatcgacca	300
gcaattttat cgattacatt agcctgttta gtaaaccaaa aaacacatta cccgtttgaa	360
gttatcgtga cagatgatgg tagtcaggaa gatctatcac cgatcattcg ccaatatgaa	420
aataaattgg atattcgcta cgtcagacaa aaagataacg gttttcaagc cagtgccgct	480
cggaatatgg gattacgctt agcaaaatat gactttattg gcttactcga ctgtgatatg	540
gcgccaaatc cattatgggt tcattcttat gttgcagagc tattagaaga tgatgattta	600
acaatcattg gtccaagaaa atacatcgat acacaacata ttgacccaaa agacttctta	660
aataacgcga gtttgcttga atcattacca gaagtgaana ccaataatag tgttgccgca	720
aaaggggaag gaacagtttc tctggattgg cgcttagaac aattcgaaaa aacagaaaat	780
ctccgcttat ccgattcgcc tttccgtttt tttgcggcgg gtaatgttgc tttcgctaaa	840
aaatggctaa ataaatccgg tttctttgat gaggaattta atcactgggg tggagaagat	900
gtggaatttg gatatcgctt attccgttac ggtagtttct ttaaaactat tgatggcatt	960
atggcctacc atcaagagcc accaggtaaa gaaaatgaaa ccgatcgtga agcgggaaaa	1020
aatattacgc tcgatattat gagagaaaag gtcccttata tctatagaaa acttttacca	1080
atagaagatt cgcatatcaa tagagtacct ttagtttcaa tttatatccc agcttataac	1140
tgtgcaaact atattcaacg ttgcgtagat agtgcactga atcagactgt tgttgatctc	1200
gaggtttgta tttgtaacga tggttcaaca gataatacct tagaagtgat caataagctt	1260
tatggtaata atcctagggg acgcatcatg tctaaaccaa atggcggaat agcctcagca	1320
tcaaatgcag ccgtttcttt tgctaaagggt tattacattg ggcagttaga ttcagatgat	1380
tatcttgagc ctgatgcagt tgaactgtgt ttaaaagaat ttttaaaaga taaaacgcta	1440
gcttgtgttt ataccactaa tagaaacgtc aatccggatg gtagcttaat cgctaattgg	1500

tacaattggc	cagaattttc	acgagaaaaa	ctcacaacgg	ctatgattgc	tcaccacttt	1560
agaatgttca	cgattagagc	ttggcattta	actgatggat	tcaatgaaaa	aattgaaaat	1620
gccgtagact	atgacatggt	cctcaaactc	agtgaagttg	gaaaatttaa	acatcttaat	1680
aaaatctgct	ataaccgtgt	attacatggg	gataacacat	caattaagaa	acttggcatt	1740
caaaagaaaa	accattttgt	tgtagtcaat	cagtcattaa	atagacaagg	cataacttat	1800
tataattatg	acgaatttga	tgatttagat	gaaagtagaa	agtatatatt	caataaaacc	1860
gctgaatatc	aagaagagat	tgatatctta	aaagatatatt	aa		1902

<210> 29
 <211> 1830
 <212> DNA
 <213> *Pasteurella multocida*

<400> 29	
atgttaaaaa	ataaatggaa attgctcact gagaagaaat ctgaaaatgc ggaggtaaga 60
gcggtcgcgc	ttgtaccaa agattttccc aaagatctgg ttttagcgcc ttacctgat 120
catgttaatg	attttacatg gtacaaaaag cgaaagaaaa gacttggcat aaaacctgaa 180
catcaacatg	ttggctcttc tattatcggt acaacattca atcgaccagc aattttatcg 240
attacattag	cctgtttagt aaacaaaaa acacattacc cgtttgaagt tatcgtgaca 300
gatgatggta	gtcaggaaga tctatcaccg atcattcgcc aatatgaaaa taaattggat 360
attcgctacg	tcagacaaaa agataacggg tttcaagcca gtgccgctcg gaatatggga 420
ttacgcttag	caaaatatga ctttattggc ttactcgact gtgatatggc gccaaatcca 480
ttatgggttc	attcttatgt tgcagagcta ttagaagatg atgatttaac aatcattggg 540
ccaagaaaat	acatcgatac acaacatatt gacccaaaag acttcttaaa taacgcgagt 600
ttgcttgaat	cattaccaga agtgaaaacc aataatagtg ttgccgcaa aggggaagga 660
acagtttctc	tggattggcg cttagaacaa ttcgaaaaaa cagaaaatct ccgcttatcc 720
gattcgccct	tccgtttttt tgcggcgggg aatgttgctt tcgctaaaa atggctaaat 780
aaatccggtt	tctttgatga ggaatttaat cactgggggtg gagaagatgt ggaatttgga 840
tatcgcttat	tccgttacgg tagtttcttt aaaactattg atggcattat ggcctaccat 900
caagagccac	caggtaaaga aaatgaaacc gatcgtgaag cgggaaaaaa tattacgctc 960
gatattatga	gagaaaaggt cccttatatc tatagaaaac ttttaccaat agaagattcg 1020
catatcaata	gagtaccttt agtttcaatt tatatccag cttataactg tgcaaactat 1080
attcaacggt	gcgtagatag tgcactgaat cagactgttg ttgatctcga ggtttgtatt 1140
tgtaacgatg	gttcaacaga taatacctta gaagtgatca ataagcttta tggtaataat 1200
cctaggggtac	gcatcatgtc taaaccaa atggcggaatag cctcagcatc aaatgcagcc 1260
gtttcttttg	ctaaagggtta ttacattggg cagtttagatt cagatgatta tcttgagcct 1320

gatgcagttg aactgtgttt aaaagaattt ttaaaagata aaacgctagc ttgtgtttat	1380
accactaata gaaacgtcaa tccggatggt agcttaatcg ctaatggtta caattggcca	1440
gaattttcac gagaaaaact cacaacggct atgattgctc accacttttag aatgttcacg	1500
attagagctt ggcatttaac tgatggattc aatgaaaaaa ttgaaaatgc cgtagactat	1560
gacatgttcc tcaaactcag tgaagttgga aaattttaac atcttaataa aatctgctat	1620
aaccgtgtat tacatggtga taacacatca attaagaaac ttggcattca aaagaaaaac	1680
cattttgttg tagtcaatca gtcattaaat agacaaggca taacttatta taattatgac	1740
gaatttgatg atttagatga aagtagaaaag tatattttca ataaaaccgc tgaatatcaa	1800
gaagagattg atatcttaaa agatatttaa	1830

<210> 30
 <211> 1764
 <212> DNA
 <213> *Pasteurella multocida*

<400> 30	
atgcttgtag caaaagattt tcccaaagat ctggttttag cgcctttacc tgatcatggt	60
aatgatttta catggtacaa aaagcgaaag aaaagacttg gcataaaacc tgaacatcaa	120
catgttggtc tttctattat cgttacaaca ttcaatcgac cagcaatttt atcgattaca	180
ttagcctgtt tagtaaacca aaaaacacat taccggttg aagttatcgt gacagatgat	240
ggtagtcagg aagatctatc accgatcatt cgccaatatg aaaataaatt ggatattcgc	300
tacgtcagac aaaaagataa cggttttcaa gccagtgccg ctcggaatat gggattacgc	360
ttagcaaaat atgactttat tggcttactc gactgtgata tggcgccaaa tccattatgg	420
gttcattctt atgttgacaga gctattagaa gatgatgatt taacaatcat tggccaaga	480
aaatacatcg atacacaaca tattgacca aaagacttct taaataacgc gagtttgctt	540
gaatcattac cagaagtga aaccaataat agtggtgccg caaaagggga aggaacagtt	600
tctctggatt ggcgcttaga acaattcgaa aaaacagaaa atctccgctt atccgattcg	660
cctttccggt tttttgcggc gggtaatggt gctttcgcta aaaaatggct aaataaatcc	720
ggtttctttg atgaggaatt taatcactgg ggtggagaag atgtggaatt tggatatcgc	780
ttattccggt acggtagttt ctttaaaact attgatggca ttatggccta ccatcaagag	840
ccaccaggta aagaaaatga aaccgatcgt gaagcgggaa aaaatattac gtcgatatt	900
atgagagaaa aggtccctta tatctataga aaacttttac caatagaaga ttcgcatatc	960
aatagagtac ctttagtttc aatttatatc ccagcttata actgtgcaaa ctatattcaa	1020
cgttgcgtag atagtgcact gaatcagact gttgttgatc tcgaggtttg tatttgtaac	1080
gatggttcaa cagataatac cttagaagtg atcaataagc tttatggtaa taatcctagg	1140

gtacgcatca tgtctaaacc aaatggcgga atagcctcag catcaaatgc agccgtttct	1200
tttgctaaag gttattacat tgggcagtta gattcagatg attatcttga gcctgatgca	1260
gttgaactgt gtttaaaaga atttttaaaa gataaaacgc tagcttgtgt ttataccact	1320
aatagaaacg tcaatccgga tggtagctta atcgctaattg gttacaattg gccagaattt	1380
tcacgagaaa aactcacaac ggctatgatt gctcaccact ttagaatggt caccgattaga	1440
gcttggcatt taactgatgg attcaatgaa aaaattgaaa atgccgtaga ctatgacatg	1500
ttcctcaaac tcagtgaagt tggaaaattt aaacatctta ataaaatctg ctataaccgt	1560
gtattacatg gtgataacac atcaattaag aaacttggca ttcaaaagaa aaaccatttt	1620
gttgtagtca atcagtcatt aaatagacaa ggcataactt attataatta tgacgaattt	1680
gatgatttag atgaaagtag aaagtatatt ttcaataaaa ccgctgaata tcaagaagag	1740
attgatatct taaaagatat ttaa	1764

<210> 31
 <211> 2007
 <212> DNA
 <213> *Pasteurella multocida*

<400> 31	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttt aaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttt ccaaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtagaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgccgagg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080

gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaattgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttggtgtt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg catataa	2007

<210> 32
 <211> 2061
 <212> DNA
 <213> *Pasteurella multocida*

<400> 32	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720

gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagttttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatattta a	2061

<210> 33
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 33	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaa	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360

aaagattttc ccaaagatct ggtttttagcg cctttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga atgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 34
<211> 2112

<212> DNA

<213> *Pasteurella multocida*

<400> 34

atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaa	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcaa ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgccggcg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaa	1260
gtcccttata tctatagaaa acttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa ttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagg	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacg	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800

actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 35
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 35	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgtagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtacca	360
aaagattttc ccaagatctt ggttttagcg cctttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcaa atgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380

agtgactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatfff caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 36
 <211> 2112
 <212> DNA
 <213> Pasteurella multocida

<400> 36	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatfttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtagaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttgggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgaaatg gcgccaaatc cattatgggt tcattcttat	780
gttcgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900

gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttggtgtt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 37
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 37	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgtagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaagatctt ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt	480

tctattatcg ttacaacatt caatcgacca gcaatTTTTat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtaatatg gcgccaaatc cattatgggt tcattcttat	780
gttgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 38
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*
 <400> 38

atgaatacat	tatcacaagc	aataaaaagca	tataacagca	atgactatca	attagcactc	60
aaattatttg	aaaagtcggc	ggaaatctat	ggacggaaaa	ttgttgaatt	tcaaattacc	120
aatgcaaaag	aaaaactctc	agcacatcct	tctgttaatt	cagcacatct	ttctgtaaat	180
aaagaagaaa	aagtcaatgt	ttgcgatagt	ccgttagata	ttgcaacaca	actgttactt	240
tccaacgtaa	aaaaattagt	actttctgac	tcggaaaaaa	acacgttaaa	aaataaatgg	300
aaattgctca	ctgagaagaa	atctgaaaat	gcggaggtaa	gagcggtcgc	ccttgtacca	360
aaagattttc	ccaagatctt	ggtttttagcg	cctttacctg	atcatgttaa	tgattttaca	420
tggtacaaaa	agcgaaagaa	aagacttggc	ataaaacctg	aacatcaaca	tgttggctct	480
tctattatcg	ttacaacatt	caatcgacca	gcaattttat	cgattacatt	agcctgttta	540
gtaaaccaa	aaacacatta	cccgtttgaa	gttatcgtga	cagatgatgg	tagtcaggaa	600
gatctatcac	cgatcattcg	ccaatatgaa	aataaattgg	atattcgcta	cgtcagacaa	660
aaagataacg	gttttcaagc	cagtgccgct	cggaatatgg	gattacgctt	agcaaaatat	720
gactttattg	gcttactcga	ctgtaaaatg	gcgccaaatc	cattatgggt	tcattcttat	780
gttgcagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgacccaa	agacttctta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tgttgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgcggcgg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tggagaagat	gtggaatttg	gatatcgctt	attccggttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggg	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaaggt	1560
tattacattg	ggcagttaga	ttcagatgat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttggtgtt	ataccactaa	tagaaacgtc	1680
aatccggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacaacgg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatgtt	cctcaaaactc	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatggg	1920

gataacacat caattaagaa acttggcatt caaaagaaaa accatTTTgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatTTT caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatatTT aa	2112

<210> 39
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 39	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatTTg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagatTTTc ccaaagatct ggTTTTagcg cTTTacctg atcatgttaa tgatTTTaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggTctt	480
tctattatcg ttacaacatt caatcgacca gcaatTTTat cgattacatt agcctgtTTa	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gTTTtcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactTTattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gTTtgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagTTTc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgTTTT	1020
tttgcgggcg gtaatgtTgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actTTTacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500

tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaaa ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 40
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 40	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaagatctt ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020

tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt	1560
tattacattg ggcagttaga atcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 41
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 41	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600

gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaaa atcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 42
 <211> 2112
 <212> DNA
 <213> Pasteurella multocida

<400> 42	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120

aaatgcaaag	aaaaactctc	agcacatcct	tctgttaatt	cagcacatct	ttctgtaa	180
aaagaagaaa	aagtcaatgt	ttgcatag	ccgttagata	ttgcaacaca	actgttactt	240
tccaacgtaa	aaaaattagt	actttctgac	tcggaaaaaa	acacgttaaa	aaataaatgg	300
aaattgctca	ctgagaagaa	atctgaaaat	gcgagggtaa	gagcggtcgc	ccttgtagca	360
aaagattttc	caaagatct	ggtttttagc	cctttacctg	atcatgttaa	tgattttaca	420
tggtacaaaa	agcgaaagaa	aagacttggc	ataaaacctg	aacatcaaca	tgttggctct	480
tctattatcg	ttacaacatt	caatcgacca	gcaattttat	cgattacatt	agcctgttta	540
gtaaaccaa	aaacacatta	cccgtttgaa	gttatcgtga	cagatgatgg	tagtcaggaa	600
gatctatcac	cgatcattcg	ccaatatgaa	aataaattgg	atattcgcta	cgtagacaaa	660
aaagataacg	gttttcaagc	cagtgccgct	cggaatatgg	gattacgctt	agcaaaatat	720
gactttattg	gcttactcga	ctgtgatatg	gcgccaaatc	cattatgggt	tcattcttat	780
gttgtagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgacccaaa	agactttcta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tggtgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgccggcg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tggaagaagat	gtggaatttg	gatatcgctt	attccgttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgcaactga	atcagactgt	tggtgatctc	gagggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggt	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaaggt	1560
tattacattg	ggcagttaga	ttcagaagat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgct	1680
aatccggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacacg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatgtt	cctcaaaact	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatggg	1920
gataacacat	caattaagaa	acttggcatt	caaaagaaaa	accattttgt	tgtagtcaat	1980
cagtcattaa	atagacaagg	cataacttat	tataattatg	acgaatttga	tgatttagat	2040

gaaagtagaa agtatatattt caataaaacc gctgaatatc aagaagagat tgatatctta 2100
aaagatatattt aa 2112

<210> 43
<211> 2112
<212> DNA
<213> *Pasteurella multocida*

<400> 43
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat 180
aaagaagaaa aagtcaatgt ttgcatagat ccgttagata ttgcaacaca actgttactt 240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtacca 360
aaagattttc ccaagatct gggttttagcg cttttacctg atcatgttaa tgattttaca 420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt 480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat 780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat 840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca 900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg 960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt 1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat 1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac 1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa 1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag 1260
gtcccttata tctatagaaa acttttacca atagaagatt cgcataatcaa tagagtacct 1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat 1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca 1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg 1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt 1560
tattacattg ggcagttaga ttcaaagat tatcttgagc ctgatgcagt tgaactgtgt 1620

ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacacggt ctatgattgc tcaccacttt agaattgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 44
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 44	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtacca	360
aaagattttc ccaagatct ggtttttagcg cctttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggtctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaacaaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140

ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgcactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggg	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaagg	1560
tattacattg	ggcagttaga	ttcaaaagat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgtc	1680
aatccggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacaacgg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatggt	cctcaaactc	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatggg	1920
gataacacat	caattaagaa	acttggcatt	caaaagaaaa	accattttgt	tgtagtcaat	1980
cagtcattaa	atagacaagg	cataacttat	tataattatg	acgaatttga	tgatttagat	2040
gaaagtagaa	agtatatttt	caataaaacc	gctgaatatc	aagaagagat	tgatatctta	2100
aaagatattt	aa					2112

<210> 45
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 45	
atgaatacat	tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
aaattatttg	aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
aatgcaaag	aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat 180
aaagaagaaa	aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt 240
tccaacgtaa	aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
aaattgctca	ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ctttgtacca 360
aaagattttc	caaagatctt ggttttagcg cttttacctg atcatgttaa tgattttaca 420
tggtacaaaa	agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt 480
tctattatcg	ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
gtaaaccaa	aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
gatctatcac	cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
aaagataacg	gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720

gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagacgat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 46
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 46	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240

tccaacgtaa	aaaaattagt	actttctgac	tcggaaaaaa	acacgttaaa	aaataaatgg	300
aaattgctca	ctgagaagaa	atctgaaaat	gcggaggtaa	gagcggtcgc	ccttgtagca	360
aaagattttc	ccaaagatct	ggtttttagcg	cctttacctg	atcatgttaa	tgattttaca	420
tggtacaaaa	agcgaaagaa	aagacttggc	ataaaacctg	aacatcaaca	tgttggtctt	480
tctattatcg	ttacaacatt	caatcgacca	gcaattttat	cgattacatt	agcctgttta	540
gtaaaccaa	aaacacatta	cccgtttgaa	gttatcgtga	cagatgatgg	tagtcaggaa	600
gatctatcac	cgatcattcg	ccaatatgaa	aataaattgg	atattcgcta	cgtcagacaa	660
aaagataacg	gttttcaagc	cagtgccgct	cggaatatgg	gattacgctt	agcaaaatat	720
gactttattg	gcttactcga	ctgtgatatg	gcgccaaatc	cattatgggt	tcattcttat	780
gttgagagc	tattagaaga	tgatgattta	acaatcattg	gtccaagaaa	atacatcgat	840
acacaacata	ttgacccaaa	agacttctta	aataacgcga	gtttgcttga	atcattacca	900
gaagtgaaaa	ccaataatag	tgttgccgca	aaaggggaag	gaacagtttc	tctggattgg	960
cgcttagaac	aattcgaaaa	aacagaaaat	ctccgcttat	ccgattcgcc	tttccgtttt	1020
tttgcggcgg	gtaatgttgc	tttcgctaaa	aaatggctaa	ataaatccgg	tttctttgat	1080
gaggaattta	atcactgggg	tggaacaagat	gtggaatttg	gatatcgctt	attccgttac	1140
ggtagtttct	ttaaaactat	tgatggcatt	atggcctacc	atcaagagcc	accaggtaaa	1200
gaaaatgaaa	ccgatcgtga	agcgggaaaa	aatattacgc	tcgatattat	gagagaaaag	1260
gtcccttata	tctatagaaa	actttttacca	atagaagatt	cgcatatcaa	tagagtacct	1320
ttagtttcaa	tttatatccc	agcttataac	tgtgcaaact	atattcaacg	ttgcgtagat	1380
agtgactga	atcagactgt	tgttgatctc	gaggtttgta	tttgtaacga	tggttcaaca	1440
gataatacct	tagaagtgat	caataagctt	tatggtaata	atcctagggt	acgcatcatg	1500
tctaaaccaa	atggcggaat	agcctcagca	tcaaatgcag	ccgtttcttt	tgctaaagggt	1560
tattacattg	ggcagttaga	ttcagatgat	tatcttgagc	ctgatgcagt	tgaactgtgt	1620
ttaaaagaat	ttttaaaaga	taaaacgcta	gcttgtgttt	ataccactaa	tagaaacgctc	1680
aatccggatg	gtagcttaat	cgctaattgg	tacaattggc	cagaattttc	acgagaaaaa	1740
ctcacaacgg	ctatgattgc	tcaccacttt	agaatgttca	cgattagagc	ttggcattta	1800
actgatggat	tcaatgaaaa	aattgaaaat	gccgtagact	atgacatgtt	cctcaaactc	1860
agtgaagttg	gaaaatttaa	acatcttaat	aaaatctgct	ataaccgtgt	attacatgggt	1920
gataacacat	caattaagaa	acttggcatt	caaagaaaa	accattttgt	tgtagtcaat	1980
cagtcattaa	atagacaagg	cataacttat	tataattatg	acgaatttga	tgatttagat	2040
gaaagtagaa	agtatatttt	caataaaacc	gctgaatatc	aagaagagat	tgatatctta	2100
aaagatattt	aa					2112

<210> 47
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 47
 atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
 aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
 aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat 180
 aaagaagaaa aagtcaatgt ttgcatagat ccgttagata ttgcaacaca actgttactt 240
 tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
 aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggctgc cttgtacca 360
 aaagattttc ccaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca 420
 tgggtacaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct 480
 tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
 gtaaaccaaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
 gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
 aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720
 gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat 780
 gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat 840
 acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca 900
 gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg 960
 cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt 1020
 tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat 1080
 gaggaattta atcactgggg tggacacgat gtggaatttg gatatcgctt attccgttac 1140
 ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa 1200
 gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag 1260
 gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct 1320
 ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat 1380
 agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca 1440
 gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg 1500
 tctaaaccaa atggcggaat agcctcagca tcaaagcag ccgtttcttt tgctaaaggt 1560
 tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt 1620
 ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc 1680
 aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa 1740

ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt ttagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatatatt aa	2112

<210> 48
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 48	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctct	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttcta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgccggcg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagaa gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260

gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagttttcaa tttatatccc agctttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggttaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaacctc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 49
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 49	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgcagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840

acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaaaat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgatga agcgggaaaa aatattacgc tcgatattat gagagaaaa	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tggtgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttggttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaattgtca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatggt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggt	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 50
 <211> 2112
 <212> DNA
 <213> *Pasteurella multocida*

<400> 50	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc ccttgtagca	360

aaagattttc ccaaagatct ggtttttagcg cctttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattccttat	780
gttgacagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaaaaa gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct	1320
ttagtttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat	1380
agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggg acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgctc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta	1800
actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc	1860
agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatggg	1920
gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat	2040
gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta	2100
aaagatattt aa	2112

<210> 51
 <211> 2136
 <212> DNA

<213> Pasteurella multocida

<400> 51

atgaacacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc	60
aaattattttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc	120
aaatgccaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaat	180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt	240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg	300
aaattgctca ctgagaagaa atctgaaaat gcggaggtaa gagcggtcgc cttgtacca	360
aaagattttc ccaaagatct ggtttttagcg cttttacctg atcatgttaa tgattttaca	420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt	480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta	540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa	600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa	660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat	720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat	780
gttgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat	840
acacaacata ttgacccaaa agactttctta aataacgcga gtttgcttga atcattacca	900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg	960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt	1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat	1080
gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac	1140
ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa	1200
gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag	1260
gtcccttata tctatagaaa acttttacca atagaagatt cgcattattca tagaatacct	1320
ttagtttcta tttatatccc cgcttataac tgtgcaaatt atattcaaag atgtgtagat	1380
agtgtcttta atcaaactgt tgtcgatctc gaggtttgta tttgtaacga tggttcaaca	1440
gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg	1500
tctaaaccaa atggcggaat agcctcagca tcaaattgcag ccgtttcttt tgctaaaggt	1560
tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt	1620
ttaaaagaat ttttaaaaga taaaacgcta gcttgtgttt ataccactaa tagaaacgtc	1680
aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa	1740
ctcacaacgg ctatgattgc tcaccatttt agaatgttta cgattagagc ttggcattta	1800
acggatggat ttaacgaaaa tattgaaaac gccgtggatt atgacatgtt ctttaaacctc	1860

agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgcgt attacatggt	1920
gataacacat ccattaagaa actcggcatt caaaagaaaa accattttgt tgtagtcaat	1980
cagtcattaa atagacaagg catcaattat tataattatg acaaatttga tgatttagat	2040
gaaagtagaa agtatatctt caataaaacc gctgaatatc aagaagaaat ggatatttta	2100
aaagatctta aactcattca gaataaagat gcctaa	2136

<210> 52
 <211> 2091
 <212> DNA
 <213> *Pasteurella multocida*

<400> 52	
atgaatacat tatcacaagc aataaaagca tataacagca atgactatga attagcactc	60
aaattatttg agaagtctgc tgaaacctac gggcgaaaaa tcgttgaatt ccaaattatc	120
aatgttaaag aaaaactctc gaccaattct tatgtaagtg aagataaaaa aaacagtgtt	180
tgcgatagct cattagatat cgcaacacag ctcttacttt ccaacgtaaa aaaattaact	240
ctatccgaat cagaaaaaaaa cagtttaaaa aataaatgga aatctatcac tgggaaaaaa	300
tcggagaacg cagaaatcag aaaggtggaa ctagtaccga aagattttcc taaagatctt	360
gttcttgctc cattgccaga tcatgttaat gattttacat ggtacaaaaa tcgaaaaaaa	420
agcttaggta taaagcctgt aaataagaat atcgggtcttt ctattattat tcctacattt	480
aatcgtagcc gtattttaga tataacgtta gcctgtttgg tcaatcagaa aacaaactac	540
ccatttgaag tcgttgttgc agatgatggg agtaaggaaa acttacttac cattgtgcaa	600
aaatacgaac aaaaacttga cataaagtat gtaagacaaa aagattatgg atatcaattg	660
tgtgcagtca gaaacttagg ttacgtaca gcaaagtatg attttgtctc gattctagac	720
tgcgatatgg caccacaaca attatgggtt cattcttatt ttacagaact attagaagac	780
aatgatattg ttttaattgg acctagaaaa tatgtggata ctcataatat taccgcagaa	840
caattcctta acgatccata tttaatagaa tctactctg aaaccgctac aaataacaat	900
ccttcgatta catcaaaagg aaatatatcg ttggattgga gattagaaca tttcaaaaaa	960
accgataatc tacgtctatg tgattcaccg tttcgttatt ttagttgcgg taatgttgca	1020
ttttctaaag aatggctaaa taaagtaggt tggttcgatg aagaatttaa tcattggggg	1080
ggcgaagatg tagaatttgg ttacagatta tttgccaaag gctgtttttt cagagtaatt	1140
gacggcggaa tggcatacca tcaagaacca cctggtaaag aaaatgaaac agaccgcgaa	1200
gctggtaaaa gtattacgct taaaattgtg aaagaaaagg taccttacat ctatagaaaa	1260
cttttaccba tagaagattc gcatatcaat agagtacctt tagtttcaat ttatatccca	1320
gcttataact gtgcaaaacta tattcaacgt tgcgtagata gtgcactgaa tcagactgtt	1380

gttgatctcg aggtttgtat ttgtaacgat ggttcaacag ataatacctt agaagtgatc 1440
 aataagcttt atggtaataa tcctagggta cgcacatgt ctaaaccaaa tggcggaata 1500
 gcctcagcat caaatgcagc cgtttctttt gctaaagggtt attacattgg gcagtttagat 1560
 tcagatgatt atcttgagcc tgatgcagtt gaactgtgtt taaaagaatt tttaaaagat 1620
 aaaacgctag cttgtgttta taccactaat agaaacgtca atccggatgg tagcttaatc 1680
 gctaattggtt acaattggcc agaattttca cgagaaaaac tcacaacggc tatgattgct 1740
 caccacttta gaatgttcac gattagagct tggcatttaa ctgatggatt caatgaaaaa 1800
 attgaaaatg ccgtagacta tgacatgttc ctcaaactca gtgaagttgg aaaatttaaa 1860
 catcttaata aaatctgcta taaccgtgta ttacatgggtg ataacacatc aattaagaaa 1920
 cttggcattc aaaagaaaaa ccattttgtt gtagtcaatc agtcattaaa tagacaaggc 1980
 ataacttatt ataattatga cgaatttgat gatttagatg aaagtagaaa gtatatatttc 2040
 aataaaaccg ctgaatatca agaagagatt gatattctta aagatattta a 2091

<210> 53
 <211> 29
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer P1

<400> 53
 atgaacacat tatcacaagc aataaaagc 29

<210> 54
 <211> 27
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer P2

<220>
 <221> misc_feature
 <222> (23)..(23)
 <223> Y = C/T

<400> 54
 gcgaatcttc tattggtaaa agytttc 27

<210> 55
 <211> 26
 <212> DNA
 <213> artificial sequence

<220>
 <223> primer P3

<400> 55

cttttaccaa tagaagattc gcatat 26

<210> 56
<211> 33
<212> DNA
<213> artificial sequence

<220>
<223> primer P4

<400> 56
gaagacgtct taggcatctt tattctgaat gag 33

<210> 57
<211> 43
<212> DNA
<213> artificial sequence

<220>
<223> primer P5

<400> 57
gggaattctg cagttaaata tcttttaaga tatcaatctc ttc 43

<210> 58
<211> 33
<212> DNA
<213> artificial sequence

<220>
<223> sense primer

<220>
<221> misc_feature
<222> (9)..(9)
<223> inosine

<220>
<221> misc_feature
<222> (12)..(12)
<223> inosine

<220>
<221> misc_feature
<222> (18)..(18)
<223> inosine

<220>
<221> misc_feature
<222> (24)..(24)
<223> inosine

<220>
<221> misc_feature
<222> (27)..(27)
<223> inosine

<400> 58
gattybntm rngarggnaa rgcnnytntay gay 33

<210> 59
 <211> 39
 <212> DNA
 <213> artificial sequence

<220>
 <223> antisense primer

<220>
 <221> misc_feature
 <222> (7)..(7)
 <223> inosine

<220>
 <221> misc_feature
 <222> (10)..(10)
 <223> inosine

<220>
 <221> misc_feature
 <222> (16)..(16)
 <223> inosine

<220>
 <221> misc_feature
 <222> (22)..(22)
 <223> inosine

<220>
 <221> misc_feature
 <222> (25)..(25)
 <223> A, G, C or T

<400> 59
 rcartancn ccrtanccra answngrtt rttrtartg

39

<210> 60
 <211> 30
 <212> DNA
 <213> artificial sequence

<220>
 <223> 2nd antisense primer

<400> 60
 tatatttaca gcagtatcat tttctaaagg

30

<210> 61
 <211> 501
 <212> PRT
 <213> Pasteurella multocida

<400> 61

Met Ser Leu Phe Lys Arg Ala Thr Glu Leu Phe Lys Ser Gly Asn Tyr
 1 5 10 15

Lys Asp Ala Leu Thr Leu Tyr Glu Asn Ile Ala Lys Ile Tyr Gly Ser
 20 25 30

Glu Ser Leu Val Lys Tyr Asn Ile Asp Ile Cys Lys Lys Asn Ile Thr
 35 40 45
 Gln Ser Lys Ser Asn Lys Ile Glu Glu Asp Asn Ile Ser Gly Glu Asn
 50 55 60
 Glu Phe Ser Val Ser Ile Lys Asp Leu Tyr Asn Glu Ile Ser Asn Ser
 65 70 75 80
 Glu Leu Gly Ile Thr Lys Glu Arg Leu Gly Ala Pro Pro Leu Val Ser
 85 90 95
 Ile Ile Met Thr Ser His Asn Thr Glu Lys Phe Ile Glu Ala Ser Ile
 100 105 110
 Asn Ser Leu Leu Leu Gln Thr Tyr Asn Asn Leu Glu Val Ile Val Val
 115 120 125
 Asp Asp Tyr Ser Thr Asp Lys Thr Phe Gln Ile Ala Ser Arg Ile Ala
 130 135 140
 Asn Ser Thr Ser Lys Val Lys Thr Phe Arg Leu Asn Ser Asn Leu Gly
 145 150 155 160
 Thr Tyr Phe Ala Lys Asn Thr Gly Ile Leu Lys Ser Lys Gly Asp Ile
 165 170 175
 Ile Phe Phe Gln Asp Ser Asp Asp Val Cys His His Glu Arg Ile Glu
 180 185 190
 Arg Cys Val Asn Ala Leu Leu Ser Asn Lys Asp Asn Ile Ala Val Arg
 195 200 205
 Cys Ala Tyr Ser Arg Ile Asn Leu Glu Thr Gln Asn Ile Ile Lys Val
 210 215 220
 Asn Asp Asn Lys Tyr Lys Leu Gly Leu Ile Thr Leu Gly Val Tyr Arg
 225 230 235 240
 Lys Val Phe Asn Glu Ile Gly Phe Phe Asn Cys Thr Thr Lys Ala Ser
 245 250 255
 Asp Asp Glu Phe Tyr His Arg Ile Ile Lys Tyr Tyr Gly Lys Asn Arg
 260 265 270
 Ile Asn Asn Leu Phe Leu Pro Leu Tyr Tyr Asn Thr Met Arg Glu Asp
 275 280 285

Ser Leu Phe Ser Asp Met Val Glu Trp Val Asp Glu Asn Asn Ile Lys
290 295 300

Gln Lys Thr Ser Asp Ala Arg Gln Asn Tyr Leu His Glu Phe Gln Lys
305 310 315 320

Ile His Asn Glu Arg Lys Phe Asn Glu Leu Lys Glu Ile Phe Ser Phe
325 330 335

Pro Arg Ile His Asp Ala Leu Pro Ile Ser Lys Glu Met Ser Lys Leu
340 345 350

Ser Asn Pro Lys Ile Pro Val Tyr Ile Asn Ile Cys Ser Ile Pro Ser
355 360 365

Arg Ile Lys Gln Leu Gln Tyr Thr Ile Gly Val Leu Lys Asn Gln Cys
370 375 380

Asp His Phe His Ile Tyr Leu Asp Gly Tyr Pro Glu Val Pro Asp Phe
385 390 395 400

Ile Lys Lys Leu Gly Asn Lys Ala Thr Val Ile Asn Cys Gln Asn Lys
405 410 415

Asn Glu Ser Ile Arg Asp Asn Gly Lys Phe Ile Leu Leu Glu Lys Leu
420 425 430

Ile Lys Glu Asn Lys Asp Gly Tyr Tyr Ile Thr Cys Asp Asp Asp Ile
435 440 445

Arg Tyr Pro Ala Asp Tyr Ile Asn Thr Met Ile Lys Lys Ile Asn Lys
450 455 460

Tyr Asn Asp Lys Ala Ala Ile Gly Leu His Gly Val Ile Phe Pro Ser
465 470 475 480

Arg Val Asn Lys Tyr Phe Ser Ser Asp Arg Ile Val Tyr Asn Phe Gln
485 490 495

Lys Thr Phe Arg Lys
500

<210> 62
<211> 1510
<212> DNA
<213> Pasteurella multocida

<400> 62

```

aatgagctta tttaaacgtg ctactgagct atttaagtca ggaaactata aagatgcact      60
aactctatat gaaaatatag ctaaaattta tggttcagaa agccttggtta aatataatat    120
tgatatatgt aaaaaaata taacacaatc aaaaagtaat aaaatagaag aagataatat    180
ttctggagaa aacgaatttt cagtatcaat aaaagatcta tataacgaaa taagcaatag    240
tgaattaggg attacaaaag aaagactagg agccccccct ctagtcagta ttataatgac    300
ttctcataat acagaaaaat tcattgaagc ctcaattaat tcactattat tgcaaacata    360
caataactta gaagttatcg ttgtagatga ttatagcaca gataaaacat ttcagatcgc    420
atccagaata gcaaaactcta caagtaaagt aaaaacattc cgattaaact caaatctagg    480
gacatacttt gcgaaaaata caggaatttt aaagtctaaa ggagatatta ttttctttca    540
ggatagcgat gatgtatgtc accatgaaag aatcgaaaga tgtgttaatg cattattatc    600
gaataaagat aatatagctg ttagatgtgc atattctaga ataaatctag aaacacaaaa    660
tataataaaa gttaatgata ataaatacaa attaggatta ataactttag gcgtttatag    720
aaaagtattt aatgaaattg gtttttttaa ctgcacaacc aaagcatcgg atgatgaatt    780
ttatcataga ataattaaat actatggtaa aaataggata aataacttat ttctaccact    840
gtattataac acaatgcgtg aagattcatt attttctgat atggttgagt gggtagatga    900
aaataatata aagcaaaaaa cctctgatgc tagacaaaat tatctccatg aattccaaaa    960
aatacacaat gaaaggaaat ttaatgaatt aaaagagatt tttagctttc ctagaattca   1020
tgacgcctta cctatatcaa aagaaatgag taagctcagc aaccctaaaa ttcctgttta   1080
tataaatata tgctcaatac cttcaagaat aaaacaactt caatacacta ttggagtact   1140
aaaaaaccaa tgcgatcatt ttcatattta tcttgatgga tatccagaag tacctgattt   1200
tataaaaaaa ctagggaata aagcgaccgt tattaattgt caaaacaaaa atgagtctat   1260
tagagataat ggaaagttta ttctattaga aaaacttata aaggaaaata aagatggata   1320
ttatataact tgtgatgatg atatccggtg tcctgctgac tacataaaca ctatgataaa   1380
aaaaattaat aaatacaatg ataaagcagc aattggatta catggtgtta tattcccaag   1440
tagagtcaac aagtattttt catcagacag aattgtctat aattttcaaa aaacctttag   1500
aaaatgatac                                     1510

```

```

<210> 63
<211> 238
<212> PRT
<213> Escherichia coli
<400> 63

```

```

Met Ile Val Ala Asn Met Ser Ser Tyr Pro Pro Arg Lys Lys Glu Leu
1           5           10           15

```

Val His Ser Ile Gln Ser Leu His Ala Gln Val Asp Lys Ile Asn Leu
20 25 30

Cys Leu Asn Glu Phe Glu Glu Ile Pro Glu Glu Leu Asp Gly Phe Ser
35 40 45

Lys Leu Asn Pro Val Ile Pro Asp Lys Asp Tyr Lys Asp Val Gly Lys
50 55 60

Phe Ile Phe Pro Cys Ala Lys Asn Asp Met Ile Val Leu Thr Asp Asp
65 70 75 80

Asp Ile Ile Tyr Pro Pro Asp Tyr Val Glu Lys Met Leu Asn Phe Tyr
85 90 95

Asn Ser Phe Ala Ile Phe Asn Cys Ile Val Gly Ile His Gly Cys Ile
100 105 110

Tyr Ile Asp Ala Phe Asp Gly Asp Gln Ser Lys Arg Lys Val Phe Ser
115 120 125

Phe Thr Gln Gly Leu Leu Arg Pro Arg Val Val Asn Gln Leu Gly Thr
130 135 140

Gly Thr Val Phe Leu Lys Ala Asp Gln Leu Pro Ser Leu Lys Tyr Met
145 150 155 160

Asp Gly Ser Gln Arg Phe Val Asp Val Arg Phe Ser Arg Tyr Met Leu
165 170 175

Glu Asn Glu Ile Gly Met Ile Cys Val Pro Arg Glu Lys Asn Trp Leu
180 185 190

Arg Glu Val Ser Ser Gly Ser Met Glu Gly Leu Trp Asn Thr Phe Thr
195 200 205

Lys Lys Trp Pro Leu Asp Ile Ile Lys Glu Thr Gln Ala Ile Ala Gly
210 215 220

Tyr Ser Lys Leu Asn Leu Glu Leu Val Tyr Asn Val Glu Gly
225 230 235

<210> 64
<211> 520
<212> PRT
<213> Escherichia coli

<400> 64

Met Asn Ala Glu Tyr Ile Asn Leu Val Glu Arg Lys Lys Lys Leu Gly
Page 76

1	5	10	15
Thr Asn Ile Gly Ala Leu Asp Phe Leu Leu Ser Ile His Lys Glu Lys	20	25	30
Val Asp Leu Gln His Lys Asn Ser Pro Leu Lys Gly Asn Asp Asn Leu	35	40	45
Ile His Lys Arg Ile Asn Glu Tyr Asp Asn Val Leu Glu Leu Ser Lys	50	55	60
Asn Val Ser Ala Gln Asn Ser Gly Asn Glu Phe Ser Tyr Leu Leu Gly	65	70	75
Tyr Ala Asp Ser Leu Arg Lys Val Gly Met Leu Asp Thr Tyr Ile Lys	85	90	95
Ile Val Cys Tyr Leu Thr Ile Gln Ser Arg Tyr Phe Lys Asn Gly Glu	100	105	110
Arg Val Lys Leu Phe Glu His Ile Ser Asn Ala Leu Arg Tyr Ser Arg	115	120	125
Ser Asp Phe Leu Ile Asn Leu Ile Phe Glu Arg Tyr Ile Glu Tyr Ile	130	135	140
Asn His Leu Lys Leu Ser Pro Lys Gln Lys Asp Phe Tyr Phe Cys Thr	145	150	155
Lys Phe Ser Lys Phe His Asp Tyr Thr Lys Asn Gly Tyr Lys Tyr Leu	165	170	175
Ala Phe Asp Asn Gln Ala Asp Ala Gly Tyr Gly Leu Thr Leu Leu Leu	180	185	190
Asn Ala Asn Asp Asp Met Gln Asp Ser Tyr Asn Leu Leu Pro Glu Gln	195	200	205
Glu Leu Phe Ile Cys Asn Ala Val Ile Asp Asn Met Asn Ile Tyr Arg	210	215	220
Ser Gln Phe Asn Lys Cys Leu Arg Lys Tyr Asp Leu Ser Glu Ile Thr	225	230	235
Asp Ile Tyr Pro Asn Lys Ile Ile Leu Gln Gly Ile Lys Phe Asp Lys	245	250	255
Lys Lys Asn Val Tyr Gly Lys Asp Leu Val Ser Ile Ile Met Ser Val			

515

520

<210> 65
 <211> 746
 <212> PRT
 <213> Mus musculus

<400> 65

Met Gln Ala Lys Lys Arg Tyr Phe Ile Leu Leu Ser Ala Gly Ser Cys
 1 5 10 15

Leu Ala Leu Leu Phe Tyr Phe Gly Gly Val Gln Phe Arg Ala Ser Arg
 20 25 30

Ser His Ser Arg Arg Glu Glu His Ser Gly Arg Asn Gly Leu His Gln
 35 40 45

Pro Ser Pro Asp His Phe Trp Pro Arg Phe Pro Asp Ala Leu Arg Pro
 50 55 60

Phe Phe Pro Trp Asp Gln Leu Glu Asn Glu Asp Ser Ser Val His Ile
 65 70 75 80

Ser Pro Arg Gln Lys Arg Asp Ala Asn Ser Ser Ile Tyr Lys Gly Lys
 85 90 95

Lys Cys Arg Met Glu Ser Cys Phe Asp Phe Thr Leu Cys Lys Lys Asn
 100 105 110

Gly Phe Lys Val Tyr Val Tyr Pro Gln Gln Lys Gly Glu Lys Ile Ala
 115 120 125

Glu Ser Tyr Gln Asn Ile Leu Ala Ala Ile Glu Gly Ser Arg Phe Tyr
 130 135 140

Thr Ser Asp Pro Ser Gln Ala Cys Leu Phe Val Leu Ser Leu Asp Thr
 145 150 155 160

Leu Asp Arg Asp Gln Leu Ser Pro Gln Tyr Val His Asn Leu Arg Ser
 165 170 175

Lys Val Gln Ser Leu His Leu Trp Asn Asn Gly Arg Asn His Leu Ile
 180 185 190

Phe Asn Leu Tyr Ser Gly Thr Trp Pro Asp Tyr Thr Glu Asp Val Gly
 195 200 205

Phe Asp Ile Gly Gln Ala Met Leu Ala Lys Ala Ser Ile Ser Thr Glu
 210 215 220

Asn Phe Arg Pro Asn Phe Asp Val Ser Ile Pro Leu Phe Ser Lys Asp
225 230 235 240

His Pro Arg Thr Gly Gly Glu Arg Gly Phe Leu Lys Phe Asn Thr Ile
245 250 255

Pro Pro Leu Arg Lys Tyr Met Leu Val Phe Lys Gly Lys Arg Tyr Leu
260 265 270

Thr Gly Ile Gly Ser Asp Thr Arg Asn Ala Leu Tyr His Val His Asn
275 280 285

Gly Glu Asp Val Leu Leu Leu Thr Thr Cys Lys His Gly Lys Asp Trp
290 295 300

Gln Lys His Lys Asp Ser Arg Cys Asp Arg Asp Asn Thr Glu Tyr Glu
305 310 315 320

Lys Tyr Asp Tyr Arg Glu Met Leu His Asn Ala Thr Phe Cys Leu Val
325 330 335

Pro Arg Gly Arg Arg Leu Gly Ser Phe Arg Phe Leu Glu Ala Leu Gln
340 345 350

Ala Ala Cys Val Pro Val Met Leu Ser Asn Gly Trp Glu Leu Pro Phe
355 360 365

Ser Glu Val Ile Asn Trp Asn Gln Ala Ala Val Ile Gly Asp Glu Arg
370 375 380

Leu Leu Leu Gln Ile Pro Ser Thr Ile Arg Ser Ile His Gln Asp Lys
385 390 395 400

Ile Leu Ala Leu Arg Gln Gln Thr Gln Phe Leu Trp Glu Ala Tyr Phe
405 410 415

Ser Ser Val Glu Lys Ile Val Leu Thr Thr Leu Glu Ile Ile Gln Asp
420 425 430

Arg Ile Phe Lys His Ile Ser Arg Asn Ser Leu Ile Trp Asn Lys His
435 440 445

Pro Gly Gly Leu Phe Val Leu Pro Gln Tyr Ser Ser Tyr Leu Gly Asp
450 455 460

Phe Pro Tyr Tyr Tyr Ala Asn Leu Gly Leu Lys Pro Pro Ser Lys Phe
465 470 475 480

Thr Ala Val Ile His Ala Val Thr Pro Leu Val Ser Gln Ser Gln Pro
485 490 495

Val Leu Lys Leu Leu Val Ala Ala Ala Lys Ser Gln Tyr Cys Ala Gln
500 505 510

Ile Ile Val Leu Trp Asn Cys Asp Lys Pro Leu Pro Ala Lys His Arg
515 520 525

Trp Pro Ala Thr Ala Val Pro Val Ile Val Ile Glu Gly Glu Ser Lys
530 535 540

Val Met Ser Ser Arg Phe Leu Pro Tyr Asp Asn Ile Ile Thr Asp Ala
545 550 555 560

Val Leu Ser Leu Asp Glu Asp Thr Val Leu Ser Thr Thr Glu Val Asp
565 570 575

Phe Ala Phe Thr Val Trp Gln Ser Phe Pro Glu Arg Ile Val Gly Tyr
580 585 590

Pro Ala Arg Ser His Phe Trp Asp Asn Ser Lys Glu Arg Trp Gly Tyr
595 600 605

Thr Ser Lys Trp Thr Asn Asp Tyr Ser Met Val Leu Thr Gly Ala Ala
610 615 620

Ile Tyr His Lys Tyr Tyr His Tyr Leu Tyr Ser His Tyr Leu Pro Ala
625 630 635 640

Ser Leu Lys Asn Met Val Asp Gln Leu Ala Asn Cys Glu Asp Ile Leu
645 650 655

Met Asn Phe Leu Val Ser Ala Val Thr Lys Leu Pro Pro Ile Lys Val
660 665 670

Thr Gln Lys Lys Gln Tyr Lys Glu Thr Met Met Gly Gln Thr Ser Arg
675 680 685

Ala Ser Arg Trp Ala Asp Pro Asp His Phe Ala Gln Arg Gln Ser Cys
690 695 700

Met Asn Thr Phe Ala Ser Trp Phe Gly Tyr Met Pro Leu Ile His Ser
705 710 715 720

Gln Met Arg Leu Asp Pro Val Leu Phe Lys Asp Gln Val Ser Ile Leu
725 730 735

Arg Lys Lys Tyr Arg Asp Ile Glu Arg Leu
740 745

<210> 66
<211> 718
<212> PRT
<213> Mus musculus

<400> 66

Met Cys Ala Ser Val Lys Ser Asn Ile Arg Gly Pro Ala Leu Ile Pro
1 5 10 15

Arg Met Lys Thr Lys His Arg Ile Tyr Tyr Val Thr Leu Phe Ser Ile
20 25 30

Val Leu Leu Gly Leu Ile Ala Thr Gly Met Phe Gln Phe Trp Pro His
35 40 45

Ser Ile Glu Ser Ser Ser Asp Gly Gly Val Glu Lys Arg Ser Ile Arg
50 55 60

Glu Val Pro Val Val Arg Leu Pro Thr Asp Ser Pro Ile Pro Glu Arg
65 70 75 80

Gly Asp Leu Ser Cys Arg Met His Thr Cys Phe Asp Val Tyr Arg Cys
85 90 95

Gly Phe Asn Pro Lys Asn Lys Ile Lys Val Tyr Ile Tyr Pro Leu Lys
100 105 110

Lys Tyr Val Asp Asp Ala Gly Val Pro Val Ser Ser Ala Ile Ser Arg
115 120 125

Glu Tyr Asn Glu Leu Leu Thr Ala Ile Ser Asp Ser Asp Tyr Tyr Thr
130 135 140

Asp Asp Ile Asn Arg Ala Cys Leu Phe Val Pro Ser Ile Asp Val Leu
145 150 155 160

Asn Gln Asn Pro Leu Arg Ile Lys Glu Thr Ala Gln Ala Leu Ala Gln
165 170 175

Leu Ser Arg Trp Asp Arg Gly Thr Asn His Leu Leu Phe Asn Met Leu
180 185 190

Pro Gly Ala Pro Pro Asp Tyr Asn Thr Ala Leu Asp Val Pro Arg Asp
195 200 205

Arg Ala Leu Leu Ala Gly Gly Gly Phe Ser Thr Trp Thr Tyr Arg Gln
 210 215 220
 Gly Tyr Asp Val Ser Ile Pro Val Phe Ser Pro Leu Ser Ala Glu Met
 225 230 235 240
 Ala Leu Pro Glu Lys Ala Pro Gly Pro Arg Arg Tyr Phe Leu Leu Ser
 245 250 255
 Ser Gln Met Ala Ile His Pro Glu Tyr Arg Glu Glu Leu Glu Ala Leu
 260 265 270
 Gln Ala Lys His Gln Glu Ser Val Leu Val Leu Asp Lys Cys Thr Asn
 275 280 285
 Leu Ser Glu Gly Val Leu Ser Val Arg Lys Arg Cys His Gln His Gln
 290 295 300
 Val Phe Asp Tyr Pro Gln Val Leu Gln Glu Ala Thr Phe Cys Thr Val
 305 310 315 320
 Leu Arg Arg Ala Arg Leu Gly Gln Ala Val Leu Ser Asp Val Leu Gln
 325 330 335
 Ala Gly Cys Val Pro Val Val Ile Ala Asp Ser Tyr Ile Leu Pro Phe
 340 345 350
 Ser Glu Val Leu Asp Trp Lys Lys Ala Ser Val Val Val Pro Glu Glu
 355 360 365
 Lys Met Ser Asp Val Tyr Ser Ile Leu Gln Asn Ile Pro Gln Arg Gln
 370 375 380
 Ile Glu Glu Met Gln Arg Gln Ala Arg Trp Phe Trp Glu Ala Tyr Phe
 385 390 395 400
 Gln Ser Ile Lys Ala Ile Ala Leu Ala Thr Leu Gln Ile Ile Asn Asp
 405 410 415
 Arg Ile Tyr Pro Tyr Ala Ala Ile Ser Tyr Glu Glu Trp Asn Asp Pro
 420 425 430
 Pro Ala Val Lys Trp Ala Ser Val Ser Asn Pro Leu Phe Leu Pro Leu
 435 440 445
 Ile Pro Pro Gln Ser Gln Gly Phe Thr Ala Ile Val Leu Thr Tyr Asp
 450 455 460

Arg Val Glu Ser Leu Phe Arg Val Ile Thr Glu Val Ser Lys Val Pro
465 470 475 480

Ser Leu Ser Lys Leu Leu Val Val Trp Asn Asn Gln Asn Lys Asn Pro
485 490 495

Pro Glu Glu Ser Leu Trp Pro Lys Ile Arg Val Pro Leu Lys Val Val
500 505 510

Arg Thr Ala Glu Asn Lys Leu Ser Asn Arg Phe Phe Pro Tyr Asp Glu
515 520 525

Ile Glu Thr Glu Ala Val Leu Ala Ile Asp Asp Asp Ile Ile Met Leu
530 535 540

Thr Ser Asp Glu Leu Gln Phe Gly Tyr Glu Val Trp Arg Glu Phe Pro
545 550 555 560

Asp Arg Leu Val Gly Tyr Pro Gly Arg Leu His Leu Trp Asp His Glu
565 570 575

Met Asn Lys Trp Lys Tyr Glu Ser Glu Trp Thr Asn Glu Val Ser Met
580 585 590

Val Leu Thr Gly Ala Ala Phe Tyr His Lys Tyr Phe Asn Tyr Leu Tyr
595 600 605

Thr Tyr Lys Met Pro Gly Asp Ile Lys Asn Trp Val Asp Ala His Met
610 615 620

Asn Cys Glu Asp Ile Ala Met Asn Phe Leu Val Ala Asn Val Thr Gly
625 630 635 640

Lys Ala Val Ile Lys Val Thr Pro Arg Lys Lys Phe Lys Cys Pro Glu
645 650 655

Cys Thr Ala Ile Asp Gly Leu Ser Leu Asp Gln Thr His Met Val Glu
660 665 670

Arg Ser Glu Cys Ile Asn Lys Phe Ala Ser Val Phe Gly Thr Met Pro
675 680 685

Leu Lys Val Val Glu His Arg Ala Asp Pro Val Leu Tyr Lys Asp Asp
690 695 700

Phe Pro Glu Lys Leu Lys Ser Phe Pro Asn Ile Gly Ser Leu
705 710 715

<210> 67
<211> 76
<212> PRT
<213> Artificial Sequence

<220>
<223> motif

<220>
<221> MISC_FEATURE
<222> (4)..(4)
<223> ANY AMINO ACID

<220>
<221> MISC_FEATURE
<222> (6)..(6)
<223> Leu or Ile

<220>
<221> MISC_FEATURE
<222> (8)..(11)
<223> any amino acid

<220>
<221> MISC_FEATURE
<222> (14)..(14)
<223> any amino acid

<220>
<221> MISC_FEATURE
<222> (15)..(15)
<223> Ser or Thr

<220>
<221> MISC_FEATURE
<222> (16)..(16)
<223> Ser or Thr

<220>
<221> MISC_FEATURE
<222> (18)..(18)
<223> Lys or Asn

<220>
<221> MISC_FEATURE
<222> (19)..(19)
<223> Thr or Ser

<220>
<221> MISC_FEATURE
<222> (20)..(25)
<223> any amino acid

<220>
<221> MISC_FEATURE
<222> (28)..(28)
<223> any amino acid

<220>
<221> MISC_FEATURE
<222> (29)..(31)
<223> Ser or Thr

<220>
 <221> MISC_FEATURE
 <222> (32)..(32)
 <223> Lys or Arg

 <220>
 <221> MISC_FEATURE
 <222> (34)..(34)
 <223> Lys or Arg

 <220>
 <221> MISC_FEATURE
 <222> (35)..(40)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (42)..(42)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (44)..(44)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (46)..(61)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (65)..(65)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (68)..(68)
 <223> any amino acid

 <220>
 <221> MISC_FEATURE
 <222> (69)..(69)
 <223> Cys or Ser

 <220>
 <221> MISC_FEATURE
 <222> (71)..(71)
 <223> His or Pro

 <220>
 <221> MISC_FEATURE
 <222> (75)..(75)
 <223> any amino acid

 <400> 67

Gln Thr Tyr Xaa Asn Xaa Glu Xaa Xaa Xaa Xaa Asp Asp Xaa Xaa Xaa
 1 5 10 15

Asp Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ile Ala Xaa Xaa Xaa Xaa Xaa
 20 25 30

Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn Xaa Gly Xaa Tyr Xaa Xaa Xaa
 35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Gln Asp
 50 55 60

Xaa Asp Asp Xaa Xaa His Xaa Glu Arg Ile Xaa Arg
 65 70 75

<210> 68
 <211> 102
 <212> PRT
 <213> Artificial sequence

<220>
 <223> motif

<220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> Lys or Arg

<220>
 <221> MISC_FEATURE
 <222> (3)..(3)
 <223> any amino acid

<220>
 <221> MISC_FEATURE
 <222> (8)..(19)
 <223> each position may be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (20)..(24)
 <223> may be missing from sequence; each position may be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (20)..(24)
 <223> all or part of sequence comprising residues 20-24 may be missing;
 each position may be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (29)..(29)
 <223> Arg or Ile

<220>
 <221> MISC_FEATURE
 <222> (32)..(32)
 <223> any amino acid

<220>
 <221> MISC_FEATURE
 <222> (35)..(37)
 <223> any amino acid

<220>
 <221> MISC_FEATURE
 <222> (39)..(84)
 <223> each position may be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (85)..(94)
 <223> all or part of sequence comprising residues 85-94 may be missing;
 each position may be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (96)..(96)
 <223> any amino acid

<400> 68

Xaa Asp Xaa Gly Lys Phe Ile Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp Asp Asp Ile Xaa Tyr Pro Xaa
 20 25 30

Asp Tyr Xaa Xaa Xaa Met Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 65 70 75 80

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Val Asn Xaa
 85 90 95

Leu Gly Thr Gly Thr Val
 100

<210> 69
 <211> 1854
 <212> DNA
 <213> Pasteurella multocida

<400> 69
 atgagcttat ttaaactgtc tactgagcta ttttaagtcag gaaactataa agatgcacta 60
 actctatatg aaaatatagc taaaatttat ggttcagaaa gccttggttaa atataatatt 120
 gatatatgta aaaaaaatat aacacaatca aaaagtaata aaatagaaga agataatatt 180
 tctggagaaa acaaattttc agtatcaata aaagatctat ataacgaaat aagcaatagt 240
 gaattagggga ttacaaaaga aagactagga gccccccctc tagtcagtat tataatgact 300
 tctcataata cagaaaaatt cattgaagcc tcaattaatt cactattatt gcaaacatac 360

aataacttag aagttatcgt tgtagatgat tatagcacag ataaaacatt tcagatcgca 420
tccagaatag caaactctac aagtaaagta aaaacattcc gattaaactc aaatctaggg 480
acatactttg cgaaaaatac aggaatttta aagtctaaag gagatattat tttctttcag 540
gatagcgatg atgtatgtca ccatgaaaga atcgaaagat gtgttaatgc attattatcg 600
aataaagata atatatgctgt tagatgtgca tattctagaa taaatctaga aacacaaaat 660
ataataaaag ttaatgataa taaatacaaa ttaggattaa taactttagg cgtttataga 720
aaagtattta atgaaattgg tttttttaac tgcacaacca aagcatcgga tgatgaattt 780
tatcatagaa taattaaata ctatggtaaa aataggataa ataacttatt tctaccactg 840
tattataaca caatgcgtga agattcatta ttttctgata tggttgagtg ggtagatgaa 900
aataatataa agcaaaaaac ctctgatgct agacaaaatt atctccatga attccaaaaa 960
atacacaatg aaaggaaatt aaatgaatta aaagagattt ttagctttcc tagaattcat 1020
gacgccttac ctatatcaaa agaaatgagt aagctcagca accctaaaat tcctgtttat 1080
ataaatatat gctcaatacc ttcaagaata aaacaacttc aatacactat tggagtacta 1140
aaaaaccaat gcgatcattt tcatatttat cttgatggat atccagaagt acctgatttt 1200
ataaaaaaac tagggaataa agcgaccgtt attaattgtc aaaacaaaaa tgagtctatt 1260
agagataatg gaaagtttat tctattagaa aaacttataa aggaaaataa agatggatat 1320
tatataactt gtgatgatga tatccggtat cctgctgact acataaacac tatgataaaa 1380
aaaattaata aatacaatga taaagcagca attggattac atgggtgttat attcccaagt 1440
agagtcaaca agtatttttc atcagacaga attgtctata attttcaaaa accttagaa 1500
aatgatactg ctgtaaataa attaggaact ggaactgttg cctttagagt atctattttt 1560
aataaatttt ctctatctga ttttgagcat cctggcatgg tagatatcta ttttctata 1620
ctatgtaaga aaaacaatat actccaagtt tgtatatcac gaccatcgaa ttggctaaca 1680
gaagataaca aaaacactga gacctatttt catgaattcc aaaatagaga tgaaatacaa 1740
agtaaactca ttatttcaaa caacccttgg ggatactcaa gtatatatcc attattaaat 1800
aataatgcta attattctga acttattccg tgtttatctt ttataacga gtaa 1854

<210> 70
<211> 617
<212> PRT
<213> Pasteurella multocida

<400> 70

Met Ser Leu Phe Lys Arg Ala Thr Glu Leu Phe Lys Ser Gly Asn Tyr
1 5 10 15

Lys Asp Ala Leu Thr Leu Tyr Glu Asn Ile Ala Lys Ile Tyr Gly Ser
20 25 30

Glu Ser Leu Val Lys Tyr Asn Ile Asp Ile Cys Lys Lys Asn Ile Thr
35 40 45

Gln Ser Lys Ser Asn Lys Ile Glu Glu Asp Asn Ile Ser Gly Glu Asn
50 55 60

Lys Phe Ser Val Ser Ile Lys Asp Leu Tyr Asn Glu Ile Ser Asn Ser
65 70 75 80

Glu Leu Gly Ile Thr Lys Glu Arg Leu Gly Ala Pro Pro Leu Val Ser
85 90 95

Ile Ile Met Thr Ser His Asn Thr Glu Lys Phe Ile Glu Ala Ser Ile
100 105 110

Asn Ser Leu Leu Leu Gln Thr Tyr Asn Asn Leu Glu Val Ile Val Val
115 120 125

Asp Asp Tyr Ser Thr Asp Lys Thr Phe Gln Ile Ala Ser Arg Ile Ala
130 135 140

Asn Ser Thr Ser Lys Val Lys Thr Phe Arg Leu Asn Ser Asn Leu Gly
145 150 155 160

Thr Tyr Phe Ala Lys Asn Thr Gly Ile Leu Lys Ser Lys Gly Asp Ile
165 170 175

Ile Phe Phe Gln Asp Ser Asp Asp Val Cys His His Glu Arg Ile Glu
180 185 190

Arg Cys Val Asn Ala Leu Leu Ser Asn Lys Asp Asn Ile Ala Val Arg
195 200 205

Cys Ala Tyr Ser Arg Ile Asn Leu Glu Thr Gln Asn Ile Ile Lys Val
210 215 220

Asn Asp Asn Lys Tyr Lys Leu Gly Leu Ile Thr Leu Gly Val Tyr Arg
225 230 235 240

Lys Val Phe Asn Glu Ile Gly Phe Phe Asn Cys Thr Thr Lys Ala Ser
245 250 255

Asp Asp Glu Phe Tyr His Arg Ile Ile Lys Tyr Tyr Gly Lys Asn Arg
260 265 270

Ile Asn Asn Leu Phe Leu Pro Leu Tyr Tyr Asn Thr Met Arg Glu Asp
275 280 285

Ser Leu Phe Ser Asp Met Val Glu Trp Val Asp Glu Asn Asn Ile Lys
290 295 300

Gln Lys Thr Ser Asp Ala Arg Gln Asn Tyr Leu His Glu Phe Gln Lys
305 310 315 320

Ile His Asn Glu Arg Lys Leu Asn Glu Leu Lys Glu Ile Phe Ser Phe
325 330 335

Pro Arg Ile His Asp Ala Leu Pro Ile Ser Lys Glu Met Ser Lys Leu
340 345 350

Ser Asn Pro Lys Ile Pro Val Tyr Ile Asn Ile Cys Ser Ile Pro Ser
355 360 365

Arg Ile Lys Gln Leu Gln Tyr Thr Ile Gly Val Leu Lys Asn Gln Cys
370 375 380

Asp His Phe His Ile Tyr Leu Asp Gly Tyr Pro Glu Val Pro Asp Phe
385 390 395 400

Ile Lys Lys Leu Gly Asn Lys Ala Thr Val Ile Asn Cys Gln Asn Lys
405 410 415

Asn Glu Ser Ile Arg Asp Asn Gly Lys Phe Ile Leu Leu Glu Lys Leu
420 425 430

Ile Lys Glu Asn Lys Asp Gly Tyr Tyr Ile Thr Cys Asp Asp Asp Ile
435 440 445

Arg Tyr Pro Ala Asp Tyr Ile Asn Thr Met Ile Lys Lys Ile Asn Lys
450 455 460

Tyr Asn Asp Lys Ala Ala Ile Gly Leu His Gly Val Ile Phe Pro Ser
465 470 475 480

Arg Val Asn Lys Tyr Phe Ser Ser Asp Arg Ile Val Tyr Asn Phe Gln
485 490 495

Lys Pro Leu Glu Asn Asp Thr Ala Val Asn Ile Leu Gly Thr Gly Thr
500 505 510

Val Ala Phe Arg Val Ser Ile Phe Asn Lys Phe Ser Leu Ser Asp Phe
515 520 525

Glu His Pro Gly Met Val Asp Ile Tyr Phe Ser Ile Leu Cys Lys Lys
530 535 540

Asn Asn Ile Leu Gln Val Cys Ile Ser Arg Pro Ser Asn Trp Leu Thr
545 550 555 560

Glu Asp Asn Lys Asn Thr Glu Thr Leu Phe His Glu Phe Gln Asn Arg
565 570 575

Asp Glu Ile Gln Ser Lys Leu Ile Ile Ser Asn Asn Pro Trp Gly Tyr
580 585 590

Ser Ser Ile Tyr Pro Leu Leu Asn Asn Asn Ala Asn Tyr Ser Glu Leu
595 600 605

Ile Pro Cys Leu Ser Phe Tyr Asn Glu
610 615

<210> 71
<211> 2112
<212> DNA
<213> Pasteurella multocida

<400> 71
atgaatacat tatcacaagc aataaaagca tataacagca atgactatca attagcactc 60
aaattatttg aaaagtcggc ggaaatctat ggacggaaaa ttgttgaatt tcaaattacc 120
aaatgcaaag aaaaactctc agcacatcct tctgttaatt cagcacatct ttctgtaaatt 180
aaagaagaaa aagtcaatgt ttgcgatagt ccgttagata ttgcaacaca actgttactt 240
tccaacgtaa aaaaattagt actttctgac tcggaaaaaa acacgttaaa aaataaatgg 300
aaattgctca ctgagaagaa atctgaaaat gcggaggttaa gagcggtcgc cttgtacca 360
aaagattttc ccaagatctt ggttttagcg cctttacctg atcatgttaa tgattttaca 420
tggtacaaaa agcgaaagaa aagacttggc ataaaacctg aacatcaaca tgttggctctt 480
tctattatcg ttacaacatt caatcgacca gcaattttat cgattacatt agcctgttta 540
gtaaaccaa aaacacatta cccgtttgaa gttatcgtga cagatgatgg tagtcaggaa 600
gatctatcac cgatcattcg ccaatatgaa aataaattgg atattcgcta cgtcagacaa 660
aaagataacg gttttcaagc cagtgccgct cggaatatgg gattacgctt agcaaaatat 720
gactttattg gcttactcga ctgtgatatg gcgccaaatc cattatgggt tcattcttat 780
gttcgagagc tattagaaga tgatgattta acaatcattg gtccaagaaa atacatcgat 840
acacaacata ttgacccaaa agacttctta aataacgcga gtttgcttga atcattacca 900
gaagtgaaaa ccaataatag tgttgccgca aaaggggaag gaacagtttc tctggattgg 960
cgcttagaac aattcgaaaa aacagaaaat ctccgcttat ccgattcgcc tttccgtttt 1020
tttgcggcgg gtaatgttgc tttcgctaaa aaatggctaa ataaatccgg tttctttgat 1080

gaggaattta atcactgggg tggagaagat gtggaatttg gatatcgctt attccgttac 1140
 ggtagtttct ttaaaactat tgatggcatt atggcctacc atcaagagcc accaggtaaa 1200
 gaaaatgaaa ccgatcgtga agcgggaaaa aatattacgc tcgatattat gagagaaaag 1260
 gtcccttata tctatagaaa actttttacca atagaagatt cgcatatcaa tagagtacct 1320
 ttagttttcaa tttatatccc agcttataac tgtgcaaact atattcaacg ttgcgtagat 1380
 agtgcactga atcagactgt tgttgatctc gaggtttgta tttgtaacga tggttcaaca 1440
 gataatacct tagaagtgat caataagctt tatggtaata atcctagggt acgcatcatg 1500
 tctaaaccaa atggcggaat agcctcagca tcaaatgcag ccgtttcttt tgctaaagggt 1560
 tattacattg ggcagttaga ttcagatgat tatcttgagc ctgatgcagt tgaactgtgt 1620
 ttaaaagaat ttttaaaaga taaaacgcta gcttggtgtt ataccactaa tagaaacgctc 1680
 aatccggatg gtagcttaat cgctaattgg tacaattggc cagaattttc acgagaaaaa 1740
 ctcaaacgg ctatgattgc tcaccacttt agaatgttca cgattagagc ttggcattta 1800
 actgatggat tcaatgaaaa aattgaaaat gccgtagact atgacatgtt cctcaaactc 1860
 agtgaagttg gaaaatttaa acatcttaat aaaatctgct ataaccgtgt attacatgggt 1920
 gataacacat caattaagaa acttggcatt caaaagaaaa accattttgt tgtagtcaat 1980
 cagtcattaa atagacaagg cataacttat tataattatg acgaatttga tgatttagat 2040
 gaaagtagaa agtatatttt caataaaacc gctgaatatc aagaagagat tgatatctta 2100
 aaagatattt aa 2112

<210> 72
 <211> 107
 <212> PRT
 <213> *Pasteurella multocida*
 <400> 72

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
 1 5 10 15
 Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
 20 25 30
 Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
 35 40 45
 Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
 50 55 60
 Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
 65 70 75 80

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
85 90 95

Val His Ser Tyr Val Ala Glu Leu Leu Glu Asp
100 105

<210> 73
<211> 105
<212> PRT
<213> Pasteurella multocida

<400> 73

Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys
1 5 10 15

Val Asp Ser Ala Leu Asn Gln Thr Thr Val Asp Leu Glu Val Cys Ile
20 25 30

Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile Asn Lys Leu
35 40 45

Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro Asn Gly Gly
50 55 60

Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr
65 70 75 80

Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu
85 90 95

Leu Cys Leu Lys Glu Phe Leu Lys Asp
100 105

<210> 74
<211> 771
<212> PRT
<213> Pasteurella multocida

<400> 74

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
85 90 95

Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
100 105 110

Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
145 150 155 160

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
165 170 175

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly
210 215 220

Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr
225 230 235 240

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp
245 250 255

Val His Ser Tyr Val Ala Glu Leu Leu Val Gln Lys Tyr Glu Gln Lys
260 265 270

Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys
275 280 285

Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser
290 295 300

Ile Leu Asp Cys Asp Met Ala Pro Gln Gln Leu Trp Val His Ser Tyr
305 310 315 320

Leu Thr Glu Leu Leu Glu Asp Asn Asp Ile Val Leu Ile Gly Pro Arg
325 330 335

Lys Tyr Val Asp Thr His Asn Ile Thr Ala Glu Gln Phe Leu Asn Asp
340 345 350

Pro Tyr Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr Asn Asn Asn Pro
355 360 365

Ser Ile Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp Arg Leu Glu His
370 375 380

Phe Lys Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser Pro Phe Arg Tyr
385 390 395 400

Phe Ser Cys Gly Asn Val Ala Phe Ser Lys Glu Trp Leu Asn Lys Val
405 410 415

Gly Trp Phe Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu
420 425 430

Phe Gly Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe Arg Val Ile Asp
435 440 445

Gly Gly Met Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr
450 455 460

Asp Arg Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile Val Lys Glu Lys
465 470 475 480

Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile
485 490 495

His Arg Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala
500 505 510

Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val
515 520 525

Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu
530 535 540

Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met
545 550 555 560

Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser
565 570 575

Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu
580 585 590

Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys
595 600 605

Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly
610 615 620

Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys
625 630 635 640

Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg
645 650 655

Ala Trp His Leu Thr Asp Gly Phe Asn Glu Asn Ile Glu Asn Ala Val
660 665 670

Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His
675 680 685

Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser
690 695 700

Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn
705 710 715 720

Gln Ser Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn Tyr Asp Lys Phe
725 730 735

Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu
740 745 750

Tyr Gln Glu Glu Met Asp Ile Leu Lys Asp Leu Lys Leu Ile Gln Asn
755 760 765

Lys Asp Ala
770

<210> 75
<211> 696
<212> PRT
<213> Pasteurella multocida

<400> 75

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
 20 25 30
 Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
 35 40 45
 Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
 50 55 60
 Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
 65 70 75 80
 Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
 85 90 95
 Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
 100 105 110
 Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
 115 120 125
 Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
 130 135 140
 Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
 145 150 155 160
 Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
 165 170 175
 Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
 180 185 190
 Glu Asn Leu Leu Thr Ile Ile Arg Gln Tyr Glu Asn Lys Leu Asp Ile
 195 200 205
 Arg Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg
 210 215 220
 Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp
 225 230 235 240
 Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu
 245 250 255
 Leu Leu Glu Asp Asp Asp Leu Thr Ile Ile Gly Pro Arg Lys Tyr Ile
 260 265 270

Asp Thr Gln His Ile Asp Pro Lys Asp Phe Leu Asn Asn Ala Ser Leu
275 280 285

Leu Glu Ser Leu Pro Glu Val Lys Thr Asn Asn Ser Val Ala Ala Lys
290 295 300

Gly Glu Gly Thr Val Ser Leu Asp Trp Arg Leu Glu Gln Phe Glu Lys
305 310 315 320

Thr Glu Asn Leu Arg Leu Ser Asp Ser Pro Phe Arg Phe Phe Ala Ala
325 330 335

Gly Asn Val Ala Phe Ala Lys Lys Trp Leu Asn Lys Ser Gly Phe Phe
340 345 350

Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly Tyr
355 360 365

Arg Leu Phe Arg Tyr Gly Ser Phe Phe Lys Thr Ile Asp Gly Ile Met
370 375 380

Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg Glu
385 390 395 400

Ala Gly Lys Asn Ile Thr Leu Asp Ile Met Arg Glu Lys Val Pro Tyr
405 410 415

Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile Asn Arg Val
420 425 430

Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile
435 440 445

Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu Glu
450 455 460

Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile
465 470 475 480

Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro
485 490 495

Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys
500 505 510

Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp
515 520 525

Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu Ala
530 535 540

Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu Ile
545 550 555 560

Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr Thr
565 570 575

Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp His
580 585 590

Leu Thr Asp Gly Phe Asn Glu Lys Ile Glu Asn Ala Val Asp Tyr Asp
595 600 605

Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn Lys
610 615 620

Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys Lys
625 630 635 640

Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser Leu
645 650 655

Asn Arg Gln Gly Ile Thr Tyr Tyr Asn Tyr Asp Glu Phe Asp Asp Leu
660 665 670

Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln Glu
675 680 685

Glu Ile Asp Ile Leu Lys Asp Ile
690 695

<210> 76
<211> 711
<212> PRT
<213> Pasteurella multocida

<400> 76

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
 50 55 60
 Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
 65 70 75 80
 Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
 85 90 95
 Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
 100 105 110
 Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
 115 120 125
 Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
 130 135 140
 Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu
 145 150 155 160
 Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr
 165 170 175
 Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile
 180 185 190
 Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln
 195 200 205
 Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Tyr Gly
 210 215 220
 Tyr Gln Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr
 225 230 235 240
 Asp Phe Val Ser Ile Leu Asp Cys Asp Met Ala Pro Gln Gln Leu Trp
 245 250 255
 Val His Ser Tyr Leu Thr Glu Leu Leu Glu Asp Asn Asp Ile Val Leu
 260 265 270
 Ile Gly Pro Arg Lys Tyr Val Asp Thr His Asn Ile Thr Ala Glu Gln
 275 280 285
 Phe Leu Asn Asp Pro Tyr Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr
 290 295 300

Asn Asn Asn Pro Ser Ile Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp
 305 310 315 320
 Arg Leu Glu His Phe Lys Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser
 325 330 335
 Pro Phe Arg Tyr Phe Ser Cys Gly Asn Val Ala Phe Ser Lys Glu Trp
 340 345 350
 Leu Asn Lys Val Gly Trp Phe Asp Glu Glu Phe Asn His Trp Gly Gly
 355 360 365
 Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe
 370 375 380
 Arg Val Ile Asp Gly Gly Met Ala Tyr His Gln Glu Pro Pro Gly Lys
 385 390 395 400
 Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile
 405 410 415
 Val Lys Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu
 420 425 430
 Asp Ser His Ile His Arg Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala
 435 440 445
 Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn
 450 455 460
 Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr
 465 470 475 480
 Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg
 485 490 495
 Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn
 500 505 510
 Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser
 515 520 525
 Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe
 530 535 540
 Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val
 545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe
565 570 575

Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met
580 585 590

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Asn Ile
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
625 630 635 640

Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
645 650 655

Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn
660 665 670

Tyr Asp Lys Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
675 680 685

Lys Thr Ala Glu Tyr Gln Glu Glu Met Asp Ile Leu Lys Asp Leu Lys
690 695 700

Leu Ile Gln Asn Lys Asp Ala
705 710

<210> 77
<211> 696
<212> PRT
<213> Pasteurella multocida

<400> 77

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
35 40 45

Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
50 55 60

Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
Page 103

65	70	75	80
Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile	85	90	95
Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val	100	105	110
Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His	115	120	125
Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile	130	135	140
Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe	145	150	155
Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln	165	170	175
Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys	180	185	190
Glu Asn Leu Leu Thr Ile Val Gln Lys Tyr Glu Gln Lys Leu Asp Ile	195	200	205
Lys Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg	210	215	220
Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp	225	230	235
Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu	245	250	255
Leu Leu Glu Asp Asp Asp Leu Thr Ile Ile Gly Pro Arg Lys Tyr Ile	260	265	270
Asp Thr Gln His Ile Asp Pro Lys Asp Phe Leu Asn Asn Ala Ser Leu	275	280	285
Leu Glu Ser Leu Pro Glu Val Lys Thr Asn Asn Ser Val Ala Ala Lys	290	295	300
Gly Glu Gly Thr Val Ser Leu Asp Trp Arg Leu Glu Gln Phe Glu Lys	305	310	315
Thr Glu Asn Leu Arg Leu Ser Asp Ser Pro Phe Arg Phe Phe Ala Ala			

	325		330		335
Gly Asn Val	Ala Phe Ala Lys Lys Trp Leu Asn Lys Ser Gly Phe Phe				
	340		345		350
Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly Tyr					
	355		360		365
Arg Leu Phe Arg Tyr Gly Ser Phe Phe Lys Thr Ile Asp Gly Ile Met					
	370		375		380
Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg Glu					
	385		390		395
Ala Gly Lys Asn Ile Thr Leu Asp Ile Met Arg Glu Lys Val Pro Tyr					
	405		410		415
Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile Asn Arg Val					
	420		425		430
Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr Ile					
	435		440		445
Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu Glu					
	450		455		460
Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val Ile					
	465		470		475
Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys Pro					
	485		490		495
Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala Lys					
	500		505		510
Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro Asp					
	515		520		525
Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu Ala					
	530		535		540
Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu Ile					
	545		550		555
Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr Thr					
	565		570		575
Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp His					

580 585 590
 Leu Thr Asp Gly Phe Asn Glu Lys Ile Glu Asn Ala Val Asp Tyr Asp
 595 600 605
 Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn Lys
 610 615 620
 Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys Lys
 625 630 635 640
 Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser Leu
 645 650 655
 Asn Arg Gln Gly Ile Thr Tyr Tyr Asn Tyr Asp Glu Phe Asp Asp Leu
 660 665 670
 Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln Glu
 675 680 685
 Glu Ile Asp Ile Leu Lys Asp Ile
 690 695

<210> 78
 <211> 40
 <212> PRT
 <213> Pasteurella multocida

<400> 78

Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln
 1 5 10 15
 Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe
 20 25 30
 Ile Gly Leu Leu Asp Cys Asp Met
 35 40

<210> 79
 <211> 40
 <212> PRT
 <213> Pasteurella multocida

<400> 79

Gln Lys Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln
 1 5 10 15
 Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe
 20 25 30

Val Ser Ile Leu Asp Cys Asp Met
35 40

<210> 80
<211> 40
<212> PRT
<213> Meleagris gallopavo

<400> 80

Glu Lys Leu Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln
1 5 10 15

Leu Cys Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe
20 25 30

Val Ser Ile Leu Asp Cys Asp Met
35 40

<210> 81
<211> 36
<212> PRT
<213> Goose

<400> 81

Val Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys
1 5 10 15

Ala Val Arg Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser
20 25 30

Ile Leu Asp Cys
35

<210> 82
<211> 33
<212> PRT
<213> sea lion

<400> 82

Lys Tyr Val Arg Gln Lys Asp Tyr Gly Tyr Gln Leu Cys Ala Val Arg
1 5 10 15

Asn Leu Gly Leu Arg Thr Ala Lys Tyr Asp Phe Val Ser Ile Leu Asp
20 25 30

Cys

<210> 83
<211> 35

<212> PRT
<213> Artificial sequence

<220>
<223> Consensus of SEQ ID NOS:78-82

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (20)..(20)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (30)..(30)
<223> Xaa can be any naturally occurring amino acid

<400> 83

Asp Ile Lys Tyr Val Arg Gln Lys Asp Tyr Gly Xaa Gln Leu Cys Ala
1 5 10 15

Val Arg Asn Xaa Gly Leu Arg Thr Ala Lys Tyr Asp Phe Xaa Ser Ile
20 25 30

Leu Asp Cys
35

<210> 84
<211> 703
<212> PRT
<213> Pasteurella multocida

<400> 84

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
1 5 10 15

Gln Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Ile Tyr Gly Arg
20 25 30

Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
35 40 45

His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
50 55 60

Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
65 70 75 80

Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
Page 108

85										90					95				
Lys	Asn	Lys	Trp	Lys	Leu	Leu	Thr	Glu	Lys	Lys	Ser	Glu	Asn	Ala	Glu				
			100					105					110						
Val	Arg	Ala	Val	Ala	Leu	Val	Pro	Lys	Asp	Phe	Pro	Lys	Asp	Leu	Val				
		115					120					125							
Leu	Ala	Pro	Leu	Pro	Asp	His	Val	Asn	Asp	Phe	Thr	Trp	Tyr	Lys	Lys				
	130					135					140								
Arg	Lys	Lys	Arg	Leu	Gly	Ile	Lys	Pro	Glu	His	Gln	His	Val	Gly	Leu				
145					150					155					160				
Ser	Ile	Ile	Val	Thr	Thr	Phe	Asn	Arg	Pro	Ala	Ile	Leu	Ser	Ile	Thr				
				165					170					175					
Leu	Ala	Cys	Leu	Val	Asn	Gln	Lys	Thr	His	Tyr	Pro	Phe	Glu	Val	Ile				
		180						185					190						
Val	Thr	Asp	Asp	Gly	Ser	Gln	Glu	Asp	Leu	Ser	Pro	Ile	Ile	Arg	Gln				
		195					200					205							
Tyr	Glu	Asn	Lys	Leu	Asp	Ile	Arg	Tyr	Val	Arg	Gln	Lys	Asp	Tyr	Gly				
	210					215					220								
Tyr	Gln	Leu	Cys	Ala	Val	Arg	Asn	Leu	Gly	Leu	Arg	Thr	Ala	Lys	Tyr				
225					230					235					240				
Asp	Phe	Val	Ser	Ile	Leu	Asp	Cys	Asp	Met	Ala	Pro	Gln	Gln	Leu	Trp				
				245					250					255					
Val	His	Ser	Tyr	Leu	Thr	Glu	Leu	Leu	Glu	Asp	Asp	Asp	Leu	Thr	Ile				
			260					265					270						
Ile	Gly	Pro	Arg	Lys	Tyr	Ile	Asp	Thr	Gln	His	Ile	Asp	Pro	Lys	Asp				
		275					280					285							
Phe	Leu	Asn	Asn	Ala	Ser	Leu	Leu	Glu	Ser	Leu	Pro	Glu	Val	Lys	Thr				
	290					295					300								
Asn	Asn	Ser	Val	Ala	Ala	Lys	Gly	Glu	Gly	Thr	Val	Ser	Leu	Asp	Trp				
305					310					315					320				
Arg	Leu	Glu	Gln	Phe	Glu	Lys	Thr	Glu	Asn	Leu	Arg	Leu	Ser	Asp	Ser				
				325					330					335					
Pro	Phe	Arg	Phe	Phe	Ala	Ala	Gly	Asn	Val	Ala	Phe	Ala	Lys	Lys	Trp				

340										345										350																																			
Leu	Asn	Lys	Ser	Gly	Phe	Phe	Asp	Glu	Glu	Phe	Asn	His	Trp	Gly	Gly																																								
		355					360					365																																											
Glu	Asp	Val	Glu	Phe	Gly	Tyr	Arg	Leu	Phe	Arg	Tyr	Gly	Ser	Phe	Phe																																								
	370					375					380																																												
Lys	Thr	Ile	Asp	Gly	Ile	Met	Ala	Tyr	His	Gln	Glu	Pro	Pro	Gly	Lys																																								
	385				390					395					400																																								
Glu	Asn	Glu	Thr	Asp	Arg	Glu	Ala	Gly	Lys	Asn	Ile	Thr	Leu	Asp	Ile																																								
				405					410																																														
Met	Arg	Glu	Lys	Val	Pro	Tyr	Ile	Tyr	Arg	Lys	Leu	Leu	Pro	Ile	Glu																																								
			420					425					430																																										
Asp	Ser	His	Ile	Asn	Arg	Val	Pro	Leu	Val	Ser	Ile	Tyr	Ile	Pro	Ala																																								
		435				440						445																																											
Tyr	Asn	Cys	Ala	Asn	Tyr	Ile	Gln	Arg	Cys	Val	Asp	Ser	Ala	Leu	Asn																																								
	450					455					460																																												
Gln	Thr	Val	Val	Asp	Leu	Glu	Val	Cys	Ile	Cys	Asn	Asp	Gly	Ser	Thr																																								
	465				470					475					480																																								
Asp	Asn	Thr	Leu	Glu	Val	Ile	Asn	Lys	Leu	Tyr	Gly	Asn	Asn	Pro	Arg																																								
				485					490					495																																									
Val	Arg	Ile	Met	Ser	Lys	Pro	Asn	Gly	Gly	Ile	Ala	Ser	Ala	Ser	Asn																																								
			500					505					510																																										
Ala	Ala	Val	Ser	Phe	Ala	Lys	Gly	Tyr	Tyr	Ile	Gly	Gln	Leu	Asp	Ser																																								
		515					520					525																																											
Asp	Asp	Tyr	Leu	Glu	Pro	Asp	Ala	Val	Glu	Leu	Cys	Leu	Lys	Glu	Phe																																								
	530					535					540																																												
Leu	Lys	Asp	Lys	Thr	Leu	Ala	Cys	Val	Tyr	Thr	Thr	Asn	Arg	Asn	Val																																								
	545				550					555					560																																								
Asn	Pro	Asp	Gly	Ser	Leu	Ile	Ala	Asn	Gly	Tyr	Asn	Trp	Pro	Glu	Phe																																								
				565					570					575																																									
Ser	Arg	Glu	Lys	Leu	Thr	Thr	Ala	Met	Ile	Ala	His	His	Phe	Arg	Met																																								
			580					585					590																																										
Phe	Thr	Ile	Arg	Ala	Trp	His	Leu	Thr	Asp	Gly	Phe	Asn	Glu	Lys	Ile																																								

595 600 605
 Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly
 610 615 620
 Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly
 625 630 635 640
 Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe
 645 650 655
 Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Thr Tyr Tyr Asn
 660 665 670
 Tyr Asp Glu Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn
 675 680 685
 Lys Thr Ala Glu Tyr Gln Glu Glu Ile Asp Ile Leu Lys Asp Ile
 690 695 700

<210> 85
 <211> 705
 <212> PRT
 <213> Pasteurella multocida

<400> 85

Met Asn Thr Leu Ser Gln Ala Ile Lys Ala Tyr Asn Ser Asn Asp Tyr
 1 5 10 15
 Glu Leu Ala Leu Lys Leu Phe Glu Lys Ser Ala Glu Thr Tyr Gly Arg
 20 25 30
 Lys Ile Val Glu Phe Gln Ile Ile Lys Cys Lys Glu Lys Leu Ser Thr
 35 40 45
 Asn Ser Tyr Val Ser Glu Asp Lys Lys Asn Ser Val Cys Asp Ser Ser
 50 55 60
 Leu Asp Ile Ala Thr Gln Leu Leu Leu Ser Asn Val Lys Lys Leu Thr
 65 70 75 80
 Leu Ser Glu Ser Glu Lys Asn Ser Leu Lys Asn Lys Trp Lys Ser Ile
 85 90 95
 Thr Gly Lys Lys Ser Glu Asn Ala Glu Ile Arg Lys Val Glu Leu Val
 100 105 110
 Pro Lys Asp Phe Pro Lys Asp Leu Val Leu Ala Pro Leu Pro Asp His
 115 120 125

Val Asn Asp Phe Thr Trp Tyr Lys Asn Arg Lys Lys Ser Leu Gly Ile
130 135 140

Lys Pro Val Asn Lys Asn Ile Gly Leu Ser Ile Ile Ile Pro Thr Phe
145 150 155 160

Asn Arg Ser Arg Ile Leu Asp Ile Thr Leu Ala Cys Leu Val Asn Gln
165 170 175

Lys Thr Asn Tyr Pro Phe Glu Val Val Val Ala Asp Asp Gly Ser Lys
180 185 190

Glu Asn Leu Leu Thr Ile Val Gln Lys Tyr Glu Gln Lys Leu Asp Ile
195 200 205

Lys Tyr Val Arg Gln Lys Asp Asn Gly Phe Gln Ala Ser Ala Ala Arg
210 215 220

Asn Met Gly Leu Arg Leu Ala Lys Tyr Asp Phe Ile Gly Leu Leu Asp
225 230 235 240

Cys Asp Met Ala Pro Asn Pro Leu Trp Val His Ser Tyr Val Ala Glu
245 250 255

Leu Leu Leu Glu Asp Asn Asp Ile Val Leu Ile Gly Pro Arg Lys Tyr
260 265 270

Val Asp Thr His Asn Ile Thr Ala Glu Gln Phe Leu Asn Asp Pro Tyr
275 280 285

Leu Ile Glu Ser Leu Pro Glu Thr Ala Thr Asn Asn Asn Pro Ser Ile
290 295 300

Thr Ser Lys Gly Asn Ile Ser Leu Asp Trp Arg Leu Glu His Phe Lys
305 310 315 320

Lys Thr Asp Asn Leu Arg Leu Cys Asp Ser Pro Phe Arg Tyr Phe Ser
325 330 335

Cys Gly Asn Val Ala Phe Ser Lys Glu Trp Leu Asn Lys Val Gly Trp
340 345 350

Phe Asp Glu Glu Phe Asn His Trp Gly Gly Glu Asp Val Glu Phe Gly
355 360 365

Tyr Arg Leu Phe Ala Lys Gly Cys Phe Phe Arg Val Ile Asp Gly Gly
370 375 380

Met Ala Tyr His Gln Glu Pro Pro Gly Lys Glu Asn Glu Thr Asp Arg
385 390 395 400

Glu Ala Gly Lys Ser Ile Thr Leu Lys Ile Val Lys Glu Lys Val Pro
405 410 415

Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu Asp Ser His Ile His Arg
420 425 430

Ile Pro Leu Val Ser Ile Tyr Ile Pro Ala Tyr Asn Cys Ala Asn Tyr
435 440 445

Ile Gln Arg Cys Val Asp Ser Ala Leu Asn Gln Thr Val Val Asp Leu
450 455 460

Glu Val Cys Ile Cys Asn Asp Gly Ser Thr Asp Asn Thr Leu Glu Val
465 470 475 480

Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg Val Arg Ile Met Ser Lys
485 490 495

Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn Ala Ala Val Ser Phe Ala
500 505 510

Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser Asp Asp Tyr Leu Glu Pro
515 520 525

Asp Ala Val Glu Leu Cys Leu Lys Glu Phe Leu Lys Asp Lys Thr Leu
530 535 540

Ala Cys Val Tyr Thr Thr Asn Arg Asn Val Asn Pro Asp Gly Ser Leu
545 550 555 560

Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe Ser Arg Glu Lys Leu Thr
565 570 575

Thr Ala Met Ile Ala His His Phe Arg Met Phe Thr Ile Arg Ala Trp
580 585 590

His Leu Thr Asp Gly Phe Asn Glu Asn Ile Glu Asn Ala Val Asp Tyr
595 600 605

Asp Met Phe Leu Lys Leu Ser Glu Val Gly Lys Phe Lys His Leu Asn
610 615 620

Lys Ile Cys Tyr Asn Arg Val Leu His Gly Asp Asn Thr Ser Ile Lys
625 630 635 640

Lys Leu Gly Ile Gln Lys Lys Asn His Phe Val Val Val Asn Gln Ser
645 650 655

Leu Asn Arg Gln Gly Ile Asn Tyr Tyr Asn Tyr Asp Lys Phe Asp Asp
660 665 670

Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn Lys Thr Ala Glu Tyr Gln
675 680 685

Glu Glu Met Asp Ile Leu Lys Asp Leu Lys Leu Ile Gln Asn Lys Asp
690 695 700

Ala
705